











**RE: Refined Metals Beech grove (UNCLASSIFIED)**  
Lindley, Laban C LRL to: Paul Stratman, Jonathan Adenuga  
Cc: "JEAN, RUTH (RJEAN@idem.IN.gov)", "matt.love@exide.com",  
"SGroce@idem.IN.gov"

08/30/2012 11:53 AM

History: This message has been forwarded.

1 attachment



document2012-08-30-070117.pdf

Classification: UNCLASSIFIED  
Caveats: NONE

Paul -

Thank you for the information. It looks like you all are striving hard to avoid and minimize impacts to the wetlands on-site.

I just have one comment about the proposed mitigation. The drawing you attached shows doing wetland mitigation in the same area of the existing wetland ditch along the rail spur. Since this is already considered a jurisdictional wetland area, you cannot do mitigation there. I was thinking we discussed trying to design the mitigation between the ditch wetland and the other existing wetlands on-site, where it is currently upland. This would essentially make the large wetland system on-site contiguous with the wetland ditch. I hand sketched what I'm talking about on your drawing in red, and attached. Depending on how much mitigation is needed, hopefully there is plenty of room in that area. Let me know if you have any questions.

Thanks,

Laban C. Lindley  
Team Leader  
U.S. Army Corps of Engineers  
Louisville District  
Indianapolis Regulatory Office  
8902 Otis Avenue, Suite S106B  
Indianapolis, IN 46216  
Phone: 317-691-2666

-----Original Message-----

From: Paul Stratman [mailto:pstratman@advancedgeoservices.com]  
Sent: Monday, August 27, 2012 2:13 PM  
To: Adenuga.Jonathan@epamail.epa.gov  
Cc: JEAN, RUTH (RJEAN@idem.IN.gov); matt.love@exide.com; Lindley, Laban C LRL; SGroce@idem.IN.gov  
Subject: Refined Metals Beech grove

Jonathan,

Pursuant to the discussions between you, Matt Love and I, attached please find



a drawing showing the conceptual changes for the Refined Metals Site in Beech Grove, Indiana. As you are aware, the changes are necessary to satisfy the Army Corps of Engineers (ACOE) requirement that we minimize disturbance of existing wetlands as a condition of necessary Section 404 Permits. We believe that the conceptual changes as presented on the attached drawing successfully address the ACOE requirements to minimize disturbance while minimizing changes to the primary components of the approved Corrective Measures Design. A description of the anticipated changes is provided below:

1. The original Containment Cell had a rectangular shape and an area of 62,700 sf (330 ft. x 190 ft.) as measured at the centerline of the proposed berm. The modified Design shows the cell rotated 90 degrees from the approved design with the northeast corner truncated and an approximate area of 58,500 sf. (a reduction of approximately 6-7%). The proposed bottom elevation and maximum grading elevations will remain at 841.5 and 860.5 respectively, with maximum 3:1 side slopes. The containment cell capacity is expected to be reduced from the current 25,600 +/- cy to approximately 22,500 +/- cy.
2. The storm water management (SWM) basin was originally proposed to be immediately east of the containment cell. The revised location will be north of the proposed containment cell. The precise configuration will not be defined until we perform storm water management calculations, but the general concept is that the SWM basin will receive runoff from the west half of the site and discharge to the drainage ditch located along the south side of the CSX tracks. Runoff from the remainder of the site is expected to flow around the east side of the cell to the existing and mitigated wetland areas. Small runoff events will sustain the existing and proposed wetlands. Larger runoff events will inundate the wetlands and discharge through the SWM basin outlet structure. If storm water calculations require additional capacity, a second SWM basin may be constructed immediately east of the rail spur.
3. Forebays will be established upslope from the proposed SWM basins to capture sediment.
4. Maximum water surface elevations for the 10 year design storm event in the SWM basin(s) will be designed to be less than elevation 841.5. Grading adjacent to the existing and mitigated wetland areas will be set to prevent detention of water higher than elevation 841.
5. Restoration grading as proposed in the approved design in areas south of the containment cell may be revised to enhance surface water runoff conditions to match the new SWM basin location(s).
6. Also at the request of the Army Corps and IDEM, swales proposed for sediment remediation along the railroad spur will be restored utilizing "soft" materials (soil and vegetation) instead of the geotextile and rip-rap proposed in the current design. Remediated portions of the swale along the CSX line will be restored using soil and periodic stone check dams.

Matt Love and I would like to meet with you and your contractor in Chicago to review the proposed changes and discuss consistency with the previously approved Corrective Measures Plan and the best path forward. Please let Matt and I know your schedule over the next few weeks.

Thank you.

Paul

## SOIL

Sampling Point: WD-8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 3/2	100					SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

## Hydric Soil Indicators:

- ☐ Histisol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☐ 2 cm Muck (A10)  
☒ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ 5 cm Mucky Peat or Peat (S3)

- ☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Loamy Mucky Mineral (F1)  
☐ Loamy Gleyed Matrix (F2)  
☐ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

## Indicators for Problematic Hydric Soils:

- ☐ Coast Prairie Redox (A16) (LRR K, L, R)  
☐ Dark Surface (S7) (LRR K, L)  
☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  
☐ Iron-Manganese Masses (F12) (LRR K, L, R)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (explain in remarks)

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric soil present? Y

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)  
☒ High Water Table (A2)  
☐ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☒ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Water-Stained Leaves (B9)

- ☐ Aquatic Fauna (B13)  
☐ True Aquatic Plants (B14)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Oxidized Rhizospheres on Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Recent Iron Reduction in Tilled Soils (C6)  
☐ Thin Muck Surface (C7)  
☐ Gauge or Well Data (D9)  
☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface water present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 Water table present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 Saturation present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:





## SOIL

Sampling Point: WD-8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 3/2	100					SCL	
								22 yr low
								96% LTR
								CTL @ 2.5'

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

## Hydric Soil Indicators:

- ☐ Histisol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☐ 2 cm Muck (A10)  
☒ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Loamy Mucky Mineral (F1)  
☐ Loamy Gleyed Matrix (F2)  
☐ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☒ Depleted Dark Surface (F7)  
☒ Redox Depressions (F8)

## Indicators for Problematic Hydric Soils:

- ☐ Coast Prairie Redox (A16) (LRR K, L, R)  
☒ Dark Surface (S7) (LRR K, L)  
☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  
☐ Iron-Manganese Masses (F12) (LRR K, L, R)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (explain in remarks)

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric soil present? Y

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)  
☐ High Water Table (A2)  
☐ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☒ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)  
☐ True Aquatic Plants (B14)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Oxidized Rhizospheres on Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Recent Iron Reduction in Tilled Soils (C6)  
☐ Thin Muck Surface (C7)  
☐ Gauge or Well Data (D9)  
☐ Other (Explain in Remarks)

## Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface water present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 Water table present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 Saturation present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

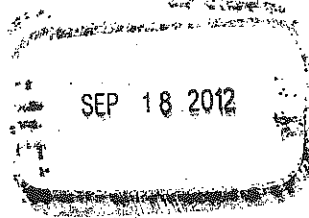
Remarks:

Midwest Region





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5  
77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604-3590



REPLY TO THE ATTENTION OF:

LU-9J

**CERTIFIED MAIL**  
**RETURN RECEIPT REQUESTED**

Matthew A. Love  
Manager-Regulatory Affairs  
Exide Corporation  
3000 Montrose Avenue  
Reading, PA 19605

Conceptual Containment Design changes  
Refined Metals Corporation  
IND 000 718 130

Dear Mr. Love:

Thanks for your August 27, 2012, email with attachment showing conceptual changes to the United States Environmental Protection Agency (EPA) approved Containment Cell design for the Refined Metals Corporation. The containment Cell is referenced in the EPA approved final Corrective Measures Design (CMD). EPA is aware that the proposed changes to the Containment design are necessary to satisfy the Army Corps of Engineers (ACOE) requirement that Refined Metals Corporation minimize disturbance of existing wetlands as a condition necessary for securing Section 404 Permits.

Based on our review at this time, no major issues were noted on the conceptual changes to the containment cell, storm water management (SWM) basin and Forebay configuration, pending final detail changes to the conceptual design. However, the following items were noted in the conceptual design:

1. Although the size of the proposed containment cell is slightly smaller than the original CMD as long as the contingency remains that any excess material will be disposed of off-site, this does not appear to be an issue.
2. It is noted that only (5) monitoring wells are shown on the conceptual drawing. The original CMD proposed (6) monitoring wells. In addition, one of the new proposed locations appears to be very close to the location of the existing monitoring well MW-8. MW-8 was proposed to be part of





the Monitored Natural Attenuation (MNA) monitoring well network in the original CMD. It appears that additional wells east and southeast of the proposed containment cell may be necessary.

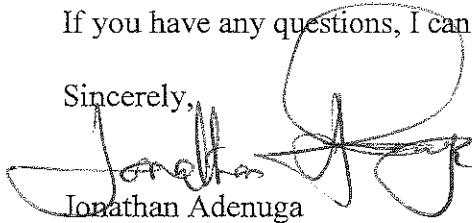
3. The proposed western-most Forebay appears to be in close vicinity to the existing monitoring well MW-2, which was also proposed in the original CMD to be part of the MNA monitoring wells network. It is not clear if construction of this Forebay would entail replacement of monitoring well MW-2.

4. It appears also that the ACOE has made some changes to the conceptual design. The ACOE changes should also be addressed.

Finally, EPA is aware that the conceptual design changes were submitted for discussion purpose; however, EPA will not approve this submittal in its current state. We suggest that you address EPA's comments and continue to work with ACOE and Indiana Department of Environmental Management for proper revision(s) of the Containment Cell design as it affects wetland issues.

If you have any questions, I can be reached at (312) 886-7954.

Sincerely,

A handwritten signature in black ink, appearing to read "Jonathan Adenuga", is written over a circular stamp. The signature is fluid and cursive.

Jonathan Adenuga  
Corrective Action Section 2  
Land and Chemicals Division

cc: Ruth Jean, IDEM





# **CORRECTIVE MEASURES IMPLEMENTATION REFINED METALS CORPORATION**

## ***Meeting Minutes***

July 26, 2012

1:15 -2:45

Purpose: Review and discuss water quality certification (Section 401) and wetlands disturbance/filling (Section 404) permitting requirements and timeframes associated with proposed Site remediation.

Participants: Matthew Love (Exide/RMC), Laban Lindley (ACOE), Jonathan Adenuga (USEPA (via telephone)), Samantha Groce (IDEM), Paul Stratman (AGC)

The following summarizes discussions from the meeting:

- L. Lindley stated that the Jurisdictional Determination (JD) has been approved by Louisville and that it is being reviewed by IDEM. He expects that the completed JD will be finalized in the next 2 weeks.
- P. Stratman provided a very brief review of project background for the benefit of S Groce and L. Lindley.
- Based on the final revised wetlands mapping completed by Keramida in May 2012 and included in the JD, the wetlands situated in the portion of the RMC Beech Grove Site west of the railroad spur and north of the former manufacturing areas of the site are 0.49 acres (see attached figure). The wetlands are hydraulically connected to the drainage ditch along the railroad spur. The drainage ditch is connected to the non-navigable Water of the U.S. Beech Creek, which is a tributary to Lick Creek. Therefore, the wetlands and the ditches are U.S. Waters regulated by the Army Corps of Engineers (ACOE) under the Clean Water Act.
- Keramida has identified 0.2 acres of State Isolated wetlands regulated by IDEM immediately south east of the railroad spur and 0.01 acres of federally regulated wetlands northeast of the railroad spur.
- The current Corrective Measures Design (CMD) includes the filling/disturbance of all of the 0.49 acres of federally regulated wetlands west of the railroad spur and remediation of approximately 1,500 lineal feet of drainage ditch (this includes the ditch along the railroad spur and railroad tracks). In addition, approximately 0.1 acres of State Isolated Wetlands are proposed to be disturbed by remediation and restoration.
- Mitigation ratio for areas of permanent disturbance is typically between 3:1 (ACOE) and 4:1 (IDEM). Current design does not provide sufficient area to perform on-site mitigation at

anticipated ratios. Encroachment must be minimized to reduce required amount of mitigation and provide space for mitigation.

- Storm water drainage features (including wetlands within the storm water basin) cannot be counted towards mitigation.
- We are required to obtain the following permits for wetlands and water quality:
  - **Site Specific Individual Section 401 Water Quality Certification** (WQC) from IDEM (because the cumulative impacted area is >0.10 acres);
  - **Nationwide Permit 38** (from ACOE) for Section 404 discharge of dredged or fill material into Water of the United States; and
  - **IDEM Isolated Wetlands General Permit** for discharge of dredged or fill material into state isolated wetlands.
  - Remediation of the drainage ditches along the railroad tracks does not meet the ACOE exemption for Maintenance of Drainage Ditches under Section 404 of the Clean Water Act. But if we modify the restoration of the drainage ditch to eliminate the rip-rap channel lining and utilize a soft/natural restoration (such as vegetation with periodic check dams) then the work can be included as an element of the NP-38 permit.
- Issuance of the Section 401 and Section 404 permits require that any activities involving the disturbance or filling of wetlands first be subject to avoidance and minimization to the maximum extent practicable. NP-38 and WQC must include a written report regarding how the design avoids and minimizes wetlands encroachment. Discussions ensued about rotating the containment cell to reduce the amount of wetlands disturbed. It was also agreed that there would be benefits to removing the mounds of dredged material between the wetlands and ditch along the west side of the rail spur to integrate these two areas.
- L. Lindley stated that the Hickory Trees in the wooded areas are also preferred habitat for the Indiana Bat, an endangered species, that must be avoided and that clearing can only be completed between the months of October 1 and March 31. The contact for more information about the Indiana Bat is Mike Litwin at the US Fish & Wildlife Service, in the Bloomington Field Office. Documentation regarding presence or absence of endangered species or protected habitat must be provided with the NP-38 submission.

The required activities and estimated time frame to proceed with permitting as developed during the meeting and during a subsequent conference call with Jonathan Adenuga will be:

- Prepare conceptual sketch showing anticipated changes to the design for review by USEPA and USEPA's contractor. Est. 1 week.

- Prepare preliminary design modifications for informal review and discussions with USEPA and USEPA's contractor. Also provide copies of preliminary design modification to ACOE and IDEM for initial input and recommendation. Est. 2 weeks.
- Finalize modifications to the CMD to reduce amount of wetlands impact. Est. 4 weeks.
- USEPA review of CMS Design modifications. Est. 2 to 4 weeks
- Finalize CMD modifications based on USEPA comments. Est. 2 weeks.
- Prepare NP-38 and Individual WQC applications coincident with CMD finalization, plus 2 weeks. Submit both applications simultaneously.
- ***Site Specific Individual Section 401 Water Quality Certification*** approx. 90 days for review.
- ***Section 404 Permits - Nationwide Permit 38*** – 60 to 90 days (concurrent with 401 review)
- ***IDEM Isolated Wetlands General Permit*** (specific to state isolated wetlands only) 30 days. Can be completed concurrent with WQC.
- ***City of Indy Drainage Permit revision*** - Storm water design and management are dictated by the City of Indianapolis so the design modification relative to storm water will be require review and re-issuance of the Storm Drainage permit by the City.

Based on the estimated timeframes shown above approximately 5 months will be required to modify the design and complete the Section 401 and 404 permitting.

847-304-2349



## INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

*We Protect Hoosiers and Our Environment.*

*Mitchell E. Daniels Jr.*  
Governor

*Thomas W. Easterly*  
Commissioner

100 North Senate Avenue  
Indianapolis, Indiana 46204  
(317) 232-8603  
Toll Free (800) 451-6027  
[www.idem.IN.gov](http://www.idem.IN.gov)

October 18, 2012

Mr. Matt Love  
Director – Global Environmental Remediation  
Exide Technologies  
P.O. Box 14294  
Reading, PA 19612-4294

Dear Mr. Love:

Re: Monitoring Well Inspection  
October 5, 2012  
Refined Metals Corporation  
Marion County  
EPA ID # IND000718130

On October 5, 2012, Mr. Marty Harmless of my staff inspected the ground water monitoring wells located at Refined Metals Corporation (RMC). A facility representative did not accompany Mr. Harmless during the well inspection. The purpose of a monitoring well inspection is to evaluate the maintenance and integrity of monitoring well components observable at the wellhead. Proper maintenance is essential for collecting representative samples and determining static water level elevations.

Our Well Inspection Sheets and monitoring well photographs record the condition of each monitoring well. You can view the Well Inspection Sheets, Verification of Inspection Sheet, and photographs that document our findings at <http://vfc.idem.IN.gov>. The VFC number for this documentation is 66968384.

At the conclusion of the well inspection, Mr. Harmless reviewed the findings and condition of the monitoring wells. The following well improvements are necessary to maintain the monitoring wells and comply with 329 IAC 3.1-10 and 40 CFR 265.

- Well identification labels are faded or not present on all wells. To ensure that data collected for a particular well are correctly associated with the well, please label the outside protective casings on all wells.
- Weep holes are not present on any of the wells. To ensure that water will drain from the space between the inner well casings and the outside protective casings, please install weep holes through the bases of the outside protective casings at all wells.



Mr. Matt Love  
Page 2

- Surface pad and outer protective casing at MW-5 show signs of subsidence. Please install a new concrete surface pad and outer protective casing at MW-5 to prevent surface water runoff from entering the well annulus, hold the protective casing in place, and protect the well from accidental damage or vandalism. We recommend that you install the new concrete pad on top of the grout seal in a continuous pour with the bottom extending below the ground surface.

Please submit documentation of the improvements within 60 days of receipt of this letter. If you require additional time to complete the improvements, contact Mr. Harmless to determine a mutually agreeable period. We ask that you provide notice to Mr. Harmless 10 days before making improvements.

Thank you for assisting us with the inspection. If you have questions, please contact Mr. Harmless at [mharmles@idem.IN.gov](mailto:mharmles@idem.IN.gov) or call (317) 234-0597.

Sincerely,



John A. Guerrettaz, LPG  
Chief, Geology Section  
Permits Branch  
Office of Land Quality

cc: Marion County Health Department  
Paul Stratman, Advance Geoservices  
Ruth Jean, OLQ  
Marty Harmless, OLQ

July 5, 2012

2003-1046-18

**VIA FEDERAL EXPRESS**

Mr. Laban Lindley  
U.S. Army Corps of Engineers  
Indianapolis Field Office  
9799 Billings Road  
Indianapolis, IN 46216

RE: Request for a Jurisdictional Determination  
Former Refined Metals Facility  
3700 South Arlington Avenue  
Beech Grove, Indiana  
Corps ID No. LRL-2012-107 lcl

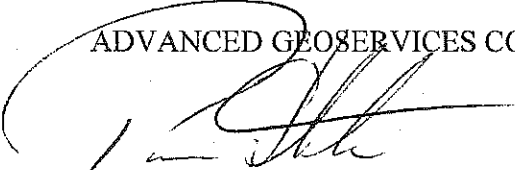
Dear Mr. Lindley:

Attached please find two hard copies and one electronic copy of the revised Wetlands Delineation Report prepared by Keramida Environmental, Inc. (dated July 3, 2012) for the above-referenced facility. This revised Wetlands Delineation Report includes soils information and photographs as requested. We believe this provides the additional information required for completion of the Jurisdictional Determination.

If you have any questions, please contact me at 601-840-9122. We appreciate your efforts to help expedite this process.

Sincerely,

ADVANCED GEOSERVICES CORP.



Paul G. Stratman, P.E., P.G.  
Senior Project Consultant

PGS:vm

Enclosures

cc: Matthew Love, Exide (one hard copy)



401 North College Avenue  
Indianapolis, Indiana 46202  
(317) 685-6600 • Fax (317) 685-6610  
**1-800-508-8034**

keramida@keramida.com • www.keramida.com

July 3, 2012

Mr. Paul Stratman  
Advanced GeoServices  
1055 Andrew Drive  
West Chester, PA 19380

Re: Wetland Delineation Report  
Former Refined Metals Property  
3700 S. Arlington Avenue  
Beech Grove, Marion County, Indiana  
KERAMIDA Project No. 14908

Dear Mr. Stratman,

KERAMIDA Environmental, Inc. (KERAMIDA) is pleased to submit this report of findings for the wetland delineation at the above-referenced Site. The Site, comprising approximately 24 acres of land, is located at the former Refined Metals property, at 3700 S. Arlington Avenue, Beech Grove, Marion County, Indiana. The purpose of the delineation was to establish the boundaries of wetland areas that were identified at the Site in previous investigations. The delineations were conducted in two separate field events and focused on two separate areas of the Site. The delineation events are discussed further below. It should be noted that the wetland in Area 1 was fully delineated in July 2011 and previously reported to and approved by the U.S. Army Corps of Engineers (USACE). The discussion of Area 1 is included in this document for reference purposes and to provide a single complete report for submittal to USACE. The wetlands in Area 2 were delineated in April 2012.

## **METHODOLOGY AND FINDINGS**

### Area 1

KERAMIDA identified a wetland area during a previous wetland determination field survey, documented in a Wetland Determination Report dated June 27, 2011 (June 2011 Wetland Determination). The wetland identified during the wetland determination was in a wooded/grassy boundary area near the northeastern portion of the Site (refer to Figure 1). This location is hereinafter referred to as Area 1.

KERAMIDA conducted a Site visit on July 14, 2011 to collect data points from Area 1 to determine the boundaries of the wetland with respect to the Site. As observed at the time of the field work, the wetland in Area 1 exhibited hydric soil and hydrologic wetland indicators. The sampling area was slightly concave with water marks apparent on nearby vegetation, indicating that water had once stood in the area. However, very little active vegetation growth was observed within the wetland. As discussed in the June 2011 Wetland Determination, a review of aerial photographs and satellite imagery indicated that the area is inundated during part of the

***INCREASING OUR CLIENTS' PROFITABILITY THROUGH SMART CONSULTING™***

ENGINEERS • GEOLOGISTS • SCIENTISTS • SAFETY PROFESSIONALS • INDUSTRIAL HYGIENISTS • TOXICOLOGISTS • MODELING EXPERTS  
INDIANAPOLIS, IN • CINCINNATI, OH • CHARLESTON, SC • SACRAMENTO, CA • ATHENS, GREECE • ABU DHABI, U.A.E.

year. This evidence suggested that hydrophytic vegetation would most likely grow in the area given the proper conditions and, therefore, the area is a wetland. Delineation of this wetland, given the absence of significant vegetation growth, was based primarily on the presence of hydric soil and hydrologic indicators

Sampling points were selected from the grassy lawn south of the wetland, from within the wetland itself, and from the wooded area bordering the northern portion of the wetland (refer to Figure 2a for sampling point locations). Each sampling point was analyzed for the presence of hydric soils, wetland hydrology and hydrophytic vegetation. The observations at each sampling point were recorded on Field Data Forms, which are enclosed herein.

Based on the visual characteristics of the wetland, and verified through the data collected from the sampling points, stakes and survey flags were placed around the boundaries of the wet prairie-type wetland (see Figure 3a). Measurements based off of the staked boundaries yielded a calculated area for the wetland of approximately 0.2 acre.

#### Area 2

During the USACE Jurisdictional Determination (JD) process, additional suspect wetlands were identified. The suspect wetlands were situated in a wooded area on the northern portion of the Site (refer to Figure 1). This location is hereinafter referred to as Area 2.

KERAMIDA conducted Site visits on April 23, 26, and 27, 2012 to collect data points from within Area 2 to determine the boundaries of the wetlands with respect to the Site. As observed at the time of the field work, Area 2 is a heavily wooded area characterized by varied topography, containing hummocks and small hills, as well as low-lying, partially inundated areas. A historic rail siding runs through Area 2, with ditches present on either side of the former rail siding. The wetlands identified during the USACE JD process are generally located adjacent to the ditches.

The low-lying, partially inundated portions of Area 2, generally located adjacent to the rail siding ditches, exhibited hydrophytic vegetation, hydric soil, and hydrologic wetland indicators, meaning that they would be classified as wetlands. The purpose of KERAMIDA's field activities was to delineate these wetlands within Area 2. Due to the generally homogeneous soil conditions and prevalence of several wetland indicator plants throughout Area 2, delineation of these wetlands was based primarily on the presence of hydrologic indicators and variations in surface topography.

Sampling points were selected from within Area 2 (refer to Figure 2b for sampling point locations). Each sampling point was analyzed for the presence of hydric soils, wetland hydrology and hydrophytic vegetation. The observations at each sampling point were recorded on Field Data Forms, which are enclosed herein.

Based on the visual characteristics of the wetlands observed in Area 2, and verified through the data collected from the sampling points, stakes and survey flags were placed around the boundaries of three floodplain forest-type wetlands (see Figure 3b). Measurements based off of the staked boundaries yielded a total calculated area for the three wetlands of approximately 0.51

acre. The individual wetland areas (two on the west side of the rail siding, and one located near the northeast corner of the Site) are estimated at: 0.33 acre, 0.16 acre, and 0.11 acre, respectively.

Representative photographs of the respective wetland areas are attached to this document. Also included is a USDA soils map of the overall property (Figure 5).

## CONCLUSIONS

### Area 1

The closest Water of the U.S. relative to Area 1 is Sloan Ditch, located approximately 1,100 feet southeast. No connection to this or any other Water of the U.S. was found during the delineation or map review. Refer to Figure 4 (topographic map) for the location of Sloan Ditch relative to Area 1. Delineation of the wetland indicated the area is approximately 0.2 acre in size, with no identified connection to a Water of the U.S. Because the wetland does not abut or adjoin a Water of the U.S., it would be considered an isolated wetland, likely classified as a Class I or Class II wetland, as defined in Indiana Code 13-11-2-25.8.

### Area 2

The wetlands in Area 2 are located generally adjacent to the ditches that run alongside a former rail spur on the property. The ditches are connected to the non-navigable Water of the U.S. Beech Creek, which is a tributary of Lick Creek. Because of the connection to a Water of the U.S., the ditches, and therefore the adjacent wetland areas, fall under the jurisdiction of USACE. It is anticipated that USACE permitting requirements will apply if the wetlands are to be disturbed.

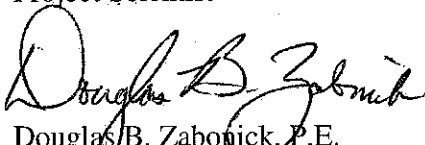
If you have any questions concerning this information, please contact Colin Keith at (317) 685-6617. Thank you for the opportunity to assist you with this project.

Sincerely,

KERAMIDA Environmental, Inc.



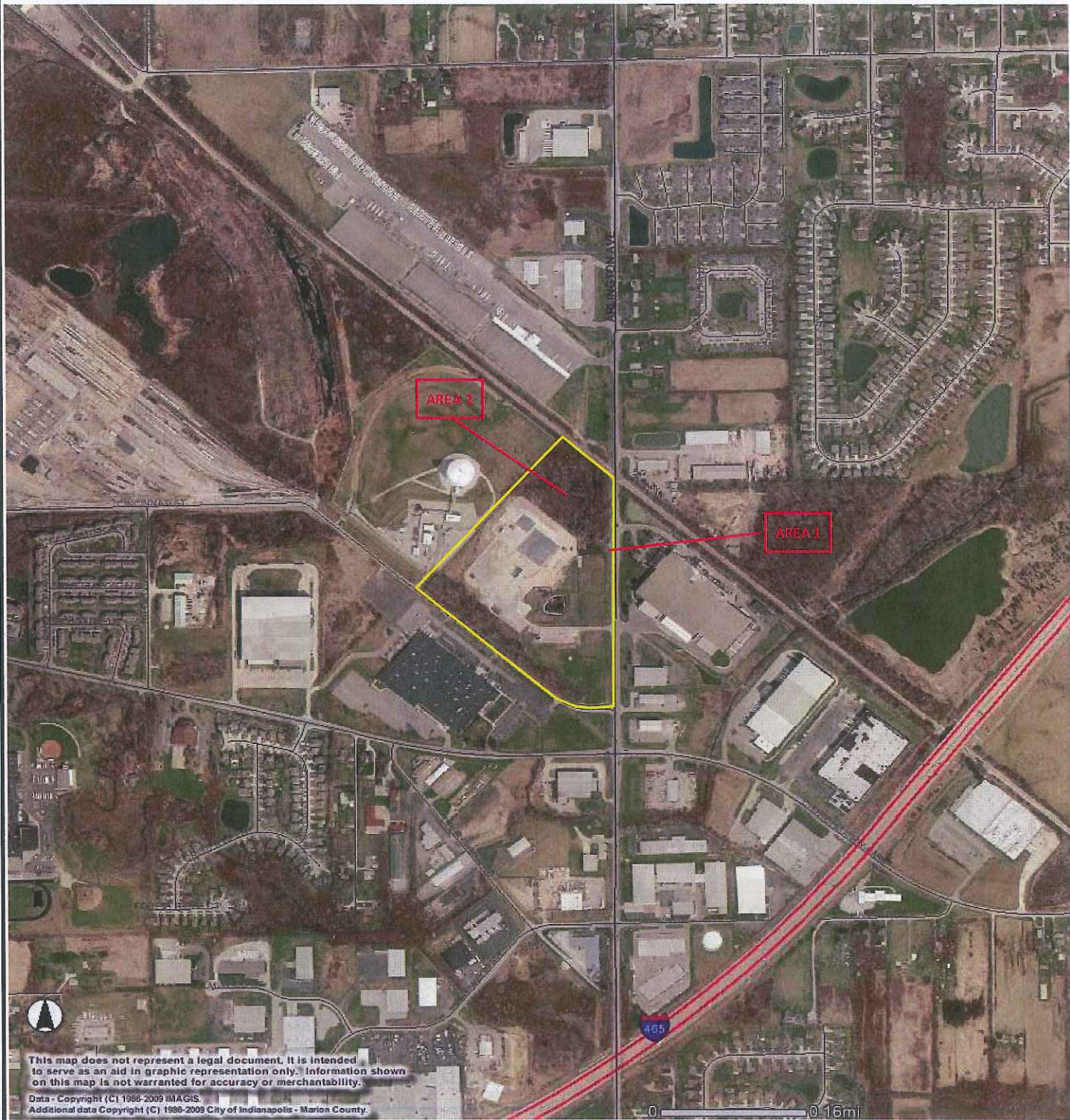
Colin Keith  
Project Scientist



Douglas B. Zabonick, P.E.  
President

Enclosures





#### Legend

Approximate Site Boundary: —

Image Source: IMAGIS, 2010 Aerial

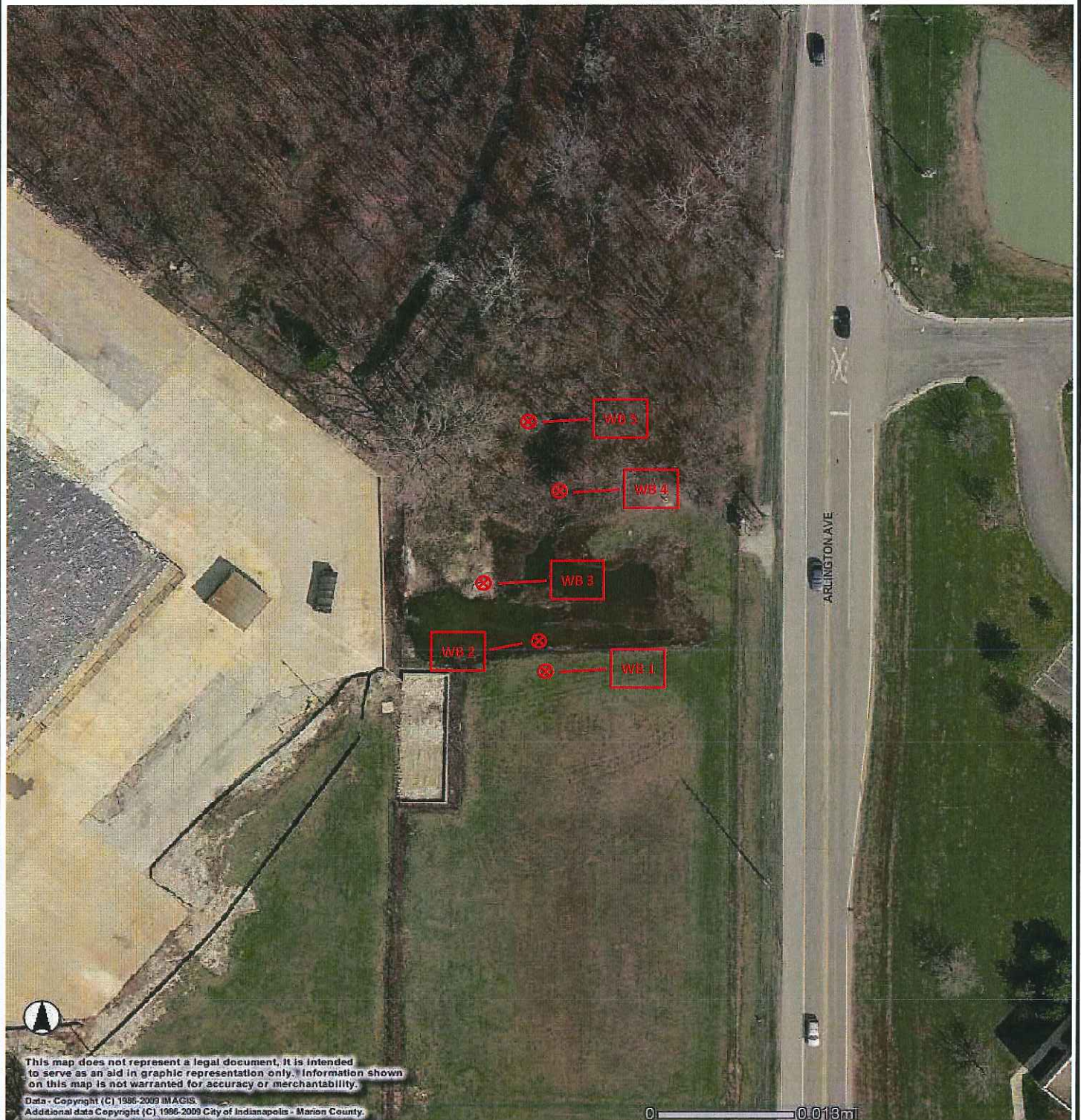


**Figure 1**  
**Site Map**  
**Former Refined Metals Property**  
**3700 South Arlington Avenue**  
**Beech Grove, Indiana**

Prepared by: CK  
Approved by: CH  
Date: 5/22/12  
Scale: as noted  
KEI Number: 14908







**Legend**  
Wetland Data Point: X

Image Source: IMAGIS, 2010 Aerial

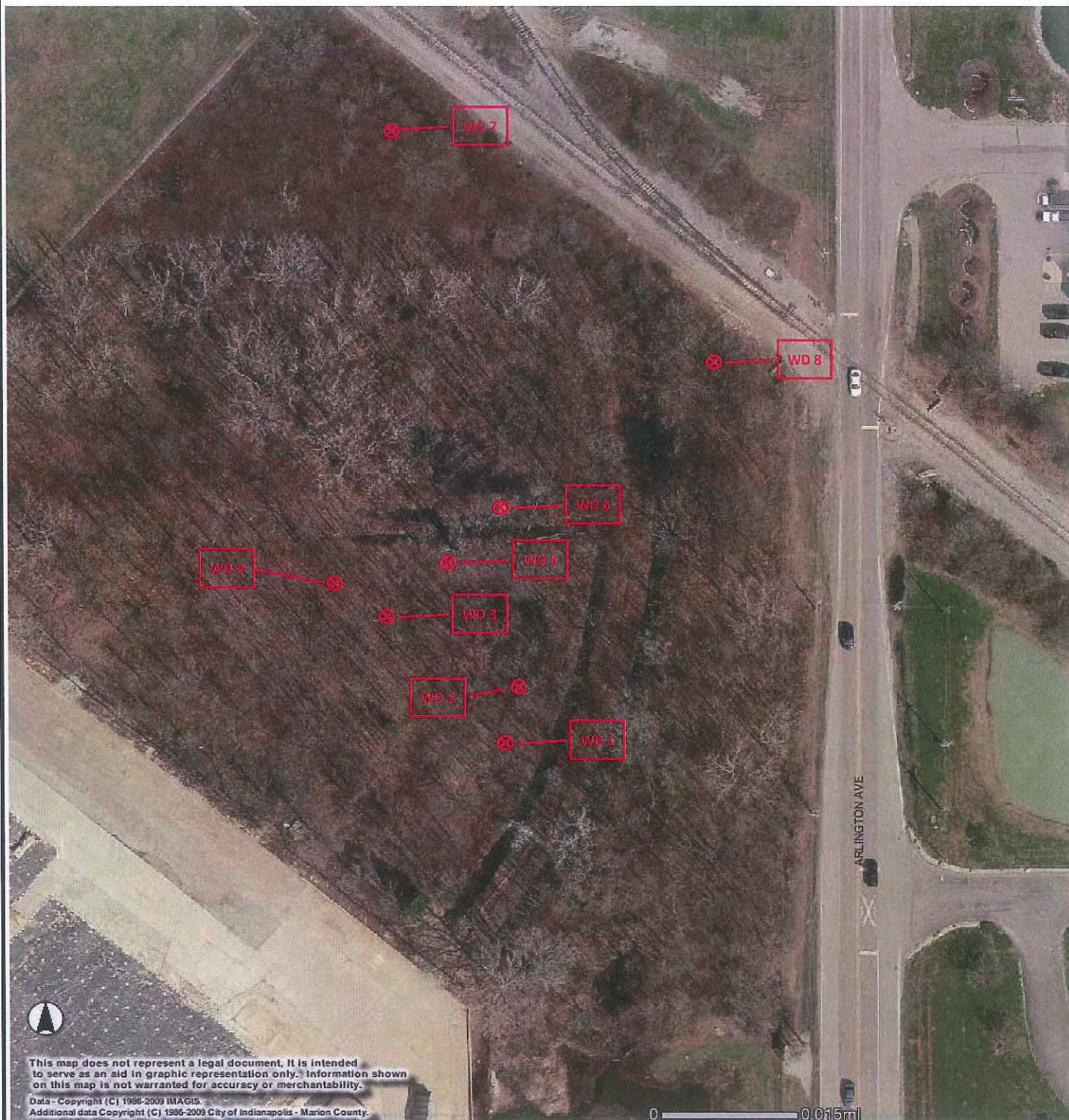


**Figure 2a**  
**Sampling Point Location Map - Area 1**  
**Former Refined Metals Property**  
**3700 South Arlington Avenue**  
**Beech Grove, Indiana**

Prepared by: CK  
Approved by: CH  
Date: 5/22/12  
Scale: as noted  
KEI Number: 14908







#### Legend

Wetland Data Point: X

Image Source: IMAGIS, 2010 Aerial

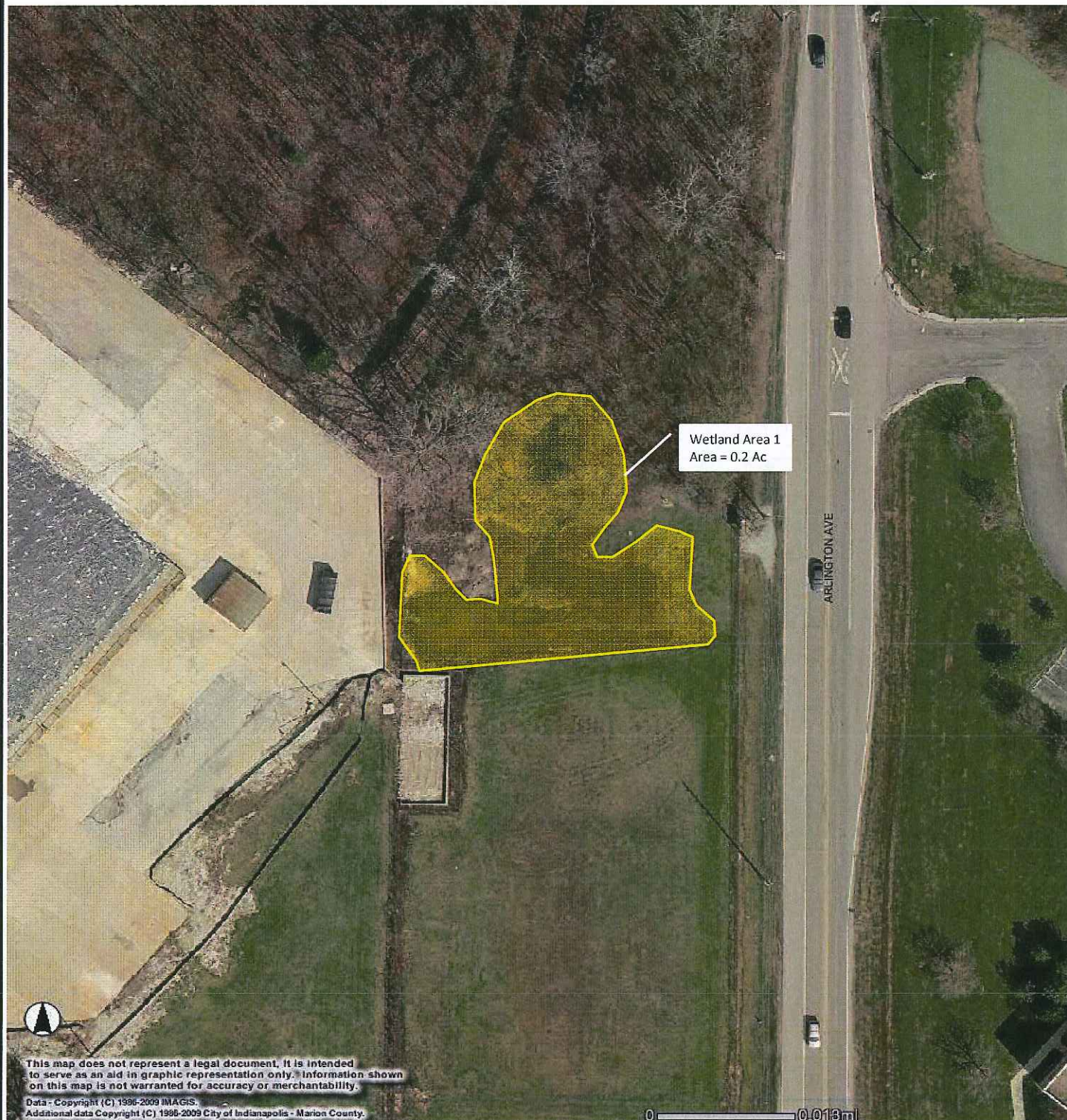


Figure 2b  
Sampling Point Location Map - Area 2  
Former Refined Metals Property  
3700 South Arlington Avenue  
Beech Grove, Indiana

Prepared by: CK  
Approved by: CH  
Date: 5/22/12  
Scale: as noted  
KEI Number: 14908







#### Legend

Approximate Wetland Boundary: ———

Image Source: IMAGIS, 2010 Aerial

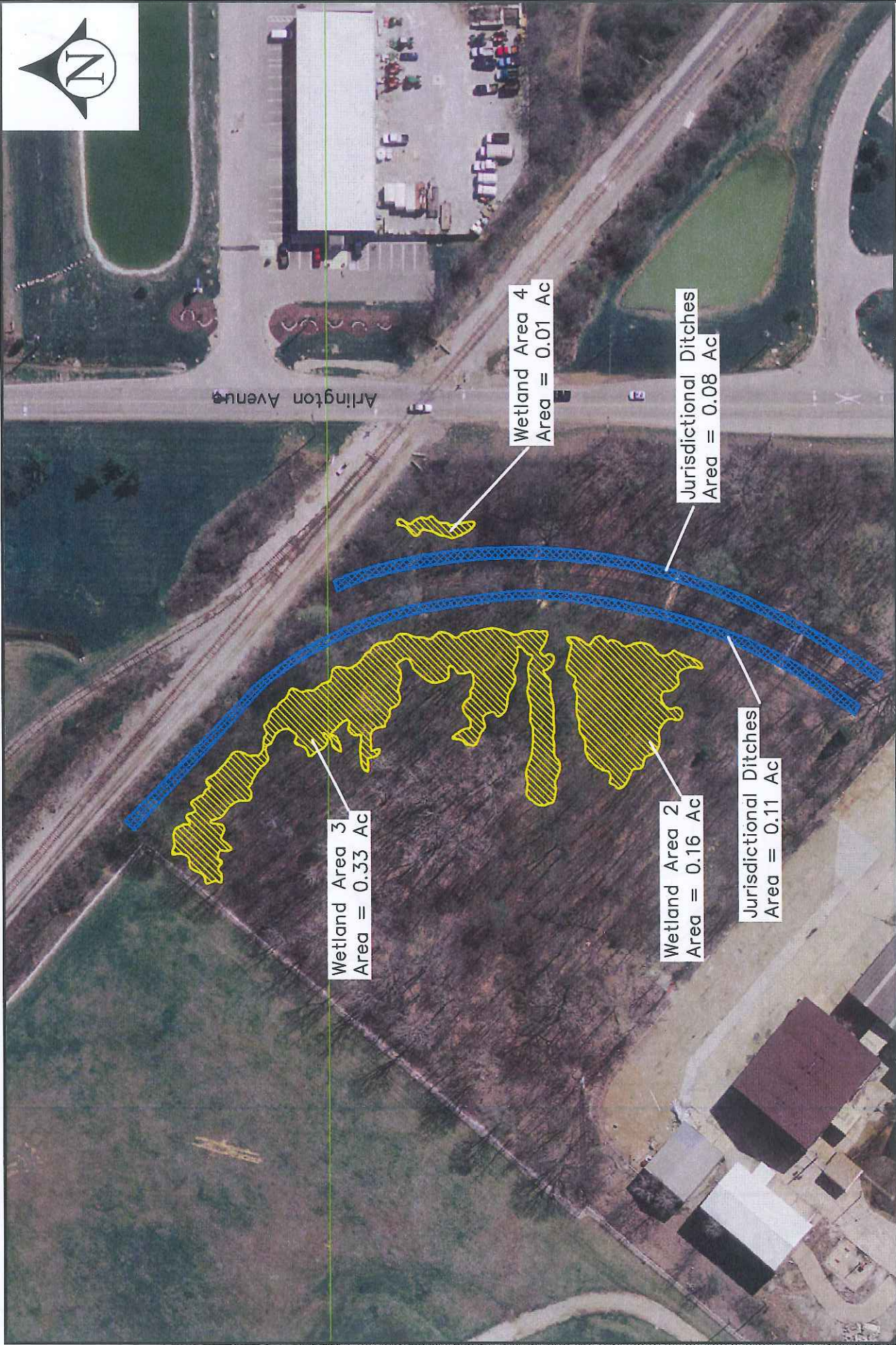


**Figure 3a**  
**Wetland Boundary Map - Area 1**  
**Former Refined Metals Property**  
**3700 South Arlington Avenue**  
**Beech Grove, Indiana**

Prepared by : CK  
Approved by: CH  
Date : 5/22/12  
Scale: as noted  
KEI Number : 14908







**Figure 3b**

Wetland Boundary Map  
Area 2

**KERAMIDA**  
Global EIS & Sustainability Services

Project: Former Refined Metals 3700 South Arlington Avenue Beech Grove, Indiana	
Project Number: 14908	Drawn By: J. DuMond Approved By: CK
Date: May 22, 2012     File No. 14908_gis	



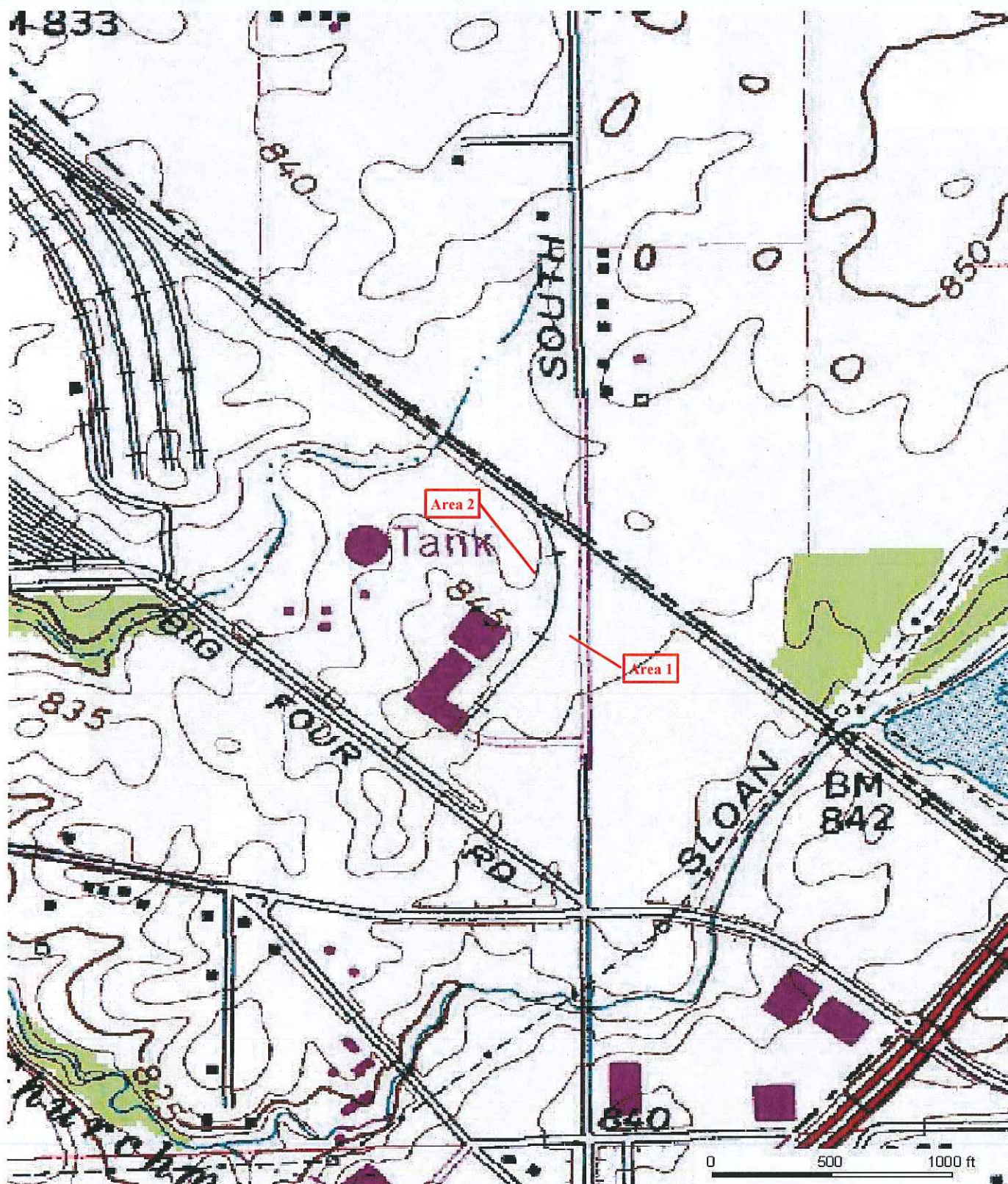


Image Source: Indiana Map





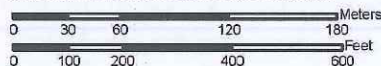
Soil Map—Marion County, Indiana  
(The Refined Metals Corp - Soils)



**Soil Legend**

Br	Brooklyn silty clay loam
CrA	Crosby silt loam, 0 to 2% slopes
MmB2	Miami Silt Loam, 2 to 6% slopes, eroded
Ub	Urban land-Brookston complex
Uc	Urban land-Crosby complex
UmB	Urban land-Miami complex, 0 to 6% slopes

Map Scale: 1:3,370 if printed on A size (8.5" x 11") sheet.



Web Soil Survey  
National Cooperative Soil Survey

6/13/2011  
Page 1 of 3



Project: Former Refined Metals  
3700 South Arlington Avenue  
Beech Grove, Indiana

Project Number: 14908	Drawn By: J. DuMond
Date: June 27, 2012	Approved By: 14908
	File No. 14908_soil

Figure 5

Soil Map



Photo Date:	Project:	Project #
July 2, 2012	Former Refined Metals Property	14908

Photo #1

Wetland in Area 1.



Photo #2

Wetland 1 in Area 2.





Photo Date:	Project:	Project #
July 2, 2012	Former Refined Metals Property	14908

Photo #3

Wetland 2 in Area 2.



Photo #4

Wetland 3 in Area 2.



# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-1  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): Slight Concave  
 Slope (%): 0 Lat: 39.71655 Long: 86.064325 Datum: WGS84  
 Soil Map Unit Name Brookston silty clay loam NWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation           , soil           , or hydrology            significantly disturbed?

Are "normal circumstances"

Are vegetation           , soil           , or hydrology            naturally problematic?

present? Yes

## SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: <u>          </u>
Hydric soil present? <u>Y</u>	
Wetland hydrology present? <u>N</u>	
Remarks: (Explain alternative procedures here or in a separate report.)	

## VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>          </u> )	Absolute % Cover	Dominant Species	Indicator Status
1	<u>Fraxinus pennsylvanica</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>
2	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
3	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
4	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
5	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
		<u>20</u>	= Total Cover	
Sapling/Shrub stratum	(Plot size: <u>          </u> )	Absolute % Cover	Dominant Species	Indicator Status
1	<u>Acer negundo</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>
2	<u>Lonicera morrowii</u>	<u>          </u>	<u>          </u>	<u>NI</u>
3	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
4	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
5	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
		<u>20</u>	= Total Cover	
Herb stratum	(Plot size: <u>          </u> )	Absolute % Cover	Dominant Species	Indicator Status
1	<u>Lonicera morrowii</u>	<u>          </u>	<u>          </u>	<u>NI</u>
2	<u>Parthenocissus quinquefolia</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>
3	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
4	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
5	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
6	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
7	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
8	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
9	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
10	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
		<u>10</u>	= Total Cover	
Woody vine stratum	(Plot size: <u>          </u> )	Absolute % Cover	Dominant Species	Indicator Status
1	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
2	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
		<u>0</u>	= Total Cover	

### Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

### Prevalence Index Worksheet

Total % Cover of:

OBL species	<u>0</u>	x 1 =	<u>0</u>
FACW species	<u>40</u>	x 2 =	<u>80</u>
FAC species	<u>10</u>	x 3 =	<u>30</u>
FACU species	<u>0</u>	x 4 =	<u>0</u>
UPL species	<u>0</u>	x 5 =	<u>0</u>
Column totals	<u>50</u>	(A)	<u>110</u> (B)

Prevalence Index = B/A = 2.20

### Hydrophytic Vegetation Indicators:

Rapid test for hydrophytic vegetation

☒ Dominance test is >50%

☒ Prevalence index is ≥3.0\*

Morphological adaptations\* (provide supporting data in Remarks or on a separate sheet)

Problematic hydrophytic vegetation\* (explain)

\*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

### Hydrophytic vegetation present?

Y

Remarks: (Include photo numbers here or on a separate sheet)

## SOIL

Sampling Point: WD-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 3/2	80	10 YR 5/6	20	RM	M	SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

## Hydric Soil Indicators:

- ☐ Histisol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☐ 2 cm Muck (A10)  
☒ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Loamy Mucky Mineral (F1)  
☐ Loamy Gleyed Matrix (F2)  
☐ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

## Indicators for Problematic Hydric Soils:

- ☐ Coast Prairie Redox (A16) (LRR K, L, R)  
☐ Dark Surface (S7) (LRR K, L)  
☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  
☐ Iron-Manganese Masses (F12) (LRR K, L, R)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (explain in remarks)

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric soil present? Y

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)  
☐ High Water Table (A2)  
☐ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Water-Stained Leaves (B9)

Secondary Indicators (minimum of two required)

- ☐ Aquatic Fauna (B13)  
☐ True Aquatic Plants (B14)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Oxidized Rhizospheres on Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Recent Iron Reduction in Tilled Soils (C6)  
☐ Thin Muck Surface (C7)  
☐ Gauge or Well Data (D9)  
☐ Other (Explain in Remarks)
- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface water present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 Water table present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 Saturation present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-2  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): Slight Concave  
 Slope (%): 0 Lat: 39.716633 Long: 86.064308 Datum: WGS84  
 Soil Map Unit Name Brookston silty clay loam VWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation       , soil       , or hydrology        significantly disturbed? Are "normal circumstances"

Are vegetation       , soil       , or hydrology        naturally problematic? present? Yes

## SUMMARY OF FINDINGS (If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u> If yes, optional wetland site ID: <u>Wetland Area 2</u>
Hydric soil present? <u>Y</u>	
Wetland hydrology present? <u>Y</u>	
Remarks: (Explain alternative procedures here or in a separate report.)	

## VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Dominance Test Worksheet</b> Number of Dominant Species that are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across all Strata: <u>3</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
1 <i>Fraxinus pennsylvanica</i>	80	Y	FACW	
2				
3				
4				
5				
		80	= Total Cover	
Sapling/Shrub stratum (Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Prevalence Index Worksheet</b> Total % Cover of: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>180</u> x 2 = <u>360</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>180</u> (A) <u>360</u> (B) Prevalence Index = B/A = <u>2.00</u>
1 <i>Acer negundo</i>	20	Y	FACW	
2 <i>Lonicera morrowii</i>			NI	
3				
4				
5				
		20	= Total Cover	
Herb stratum (Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Hydrophytic Vegetation Indicators:</b> Rapid test for hydrophytic vegetation X Dominance test is >50% X Prevalence index is ≤3.0* Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) Problematic hydrophytic vegetation* (explain) _____ *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1 <i>Lonicera morrowii</i>			NI	
2 <i>Fraxinus pennsylvanica</i>	80	Y	FACW	
3				
4				
5				
6				
7				
8				
9				
10				
		80	= Total Cover	
Woody vine stratum (Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Hydrophytic vegetation present?</b> <u>Y</u>
1				
2				
		0	= Total Cover	

Remarks: (Include photo numbers here or on a separate sheet)

## SOIL

Sampling Point: WD-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 4/1	90	7.5 YR 5/6	10	RM	M	SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

## Hydric Soil Indicators:

- |   |   |
|---|---|
| <input type="checkbox"/> Histisol (A1)                                | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)                         | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                            | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                        | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)                       | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                              | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)                     | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                     | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)                 |   |

## Indicators for Problematic Hydric Soils:

- |   |
|---|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)    |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L)               |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)  |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12)           |
| <input type="checkbox"/> Other (explain in remarks)                 |

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

## Restrictive Layer (if observed):

 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_
Hydric soil present? Y

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |   |
|---|
| <input type="checkbox"/> Surface Water (A1)                                   |
| <input checked="" type="checkbox"/> High Water Table (A2)                     |
| <input checked="" type="checkbox"/> Saturation (A3)                           |
| <input type="checkbox"/> Water Marks (B1)                                     |
| <input type="checkbox"/> Sediment Deposits (B2)                               |
| <input checked="" type="checkbox"/> Drift Deposits (B3)                       |
| <input type="checkbox"/> Algal Mat or Crust (B4)                              |
| <input type="checkbox"/> Iron Deposits (B5)                                   |
| <input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7) |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)              |
| <input checked="" type="checkbox"/> Water-Stained Leaves (B9)                 |

Secondary Indicators (minimum of two required)

- |   |  |
|---|--|
| <input type="checkbox"/> Aquatic Fauna (B13)                        | <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> True Aquatic Plants (B14)                  | <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 | <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Presence of Reduced Iron (C4)              | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Thin Muck Surface (C7)                     | <input type="checkbox"/> Geomorphic Position (D2)                  |
| <input type="checkbox"/> Gauge or Well Data (D9)                    | <input type="checkbox"/> FAC-Neutral Test (D5)                     |
| <input type="checkbox"/> Other (Explain in Remarks)                 |  |

## Field Observations:

Surface water present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____
Water table present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>12</u>
Saturation present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): _____

 (includes capillary fringe)
Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-3  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): Slight Concave  
 Slope (%): 0 Lat: 39.71675 Long: 86.064581 Datum: WGS84  
 Soil Map Unit Name Brookston silty clay loam VWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation           , soil           , or hydrology            significantly disturbed?

Are "normal circumstances"

Are vegetation           , soil           , or hydrology            naturally problematic?

present? Yes

## SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u> If yes, optional wetland site ID: <u>Wetland Area 2</u>
Hydric soil present? <u>Y</u>	
Wetland hydrology present? <u>Y</u>	
Remarks: (Explain alternative procedures here or in a separate report.)	

## VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>          </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Dominance Test Worksheet</b> Number of Dominant Species that are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across all Strata: <u>5</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
1	<u>Fraxinus pennsylvanica</u>	<u>60</u>	<u>Y</u>	<u>FACW</u>	
2	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	
3	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	
4	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	
5	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	<b>Prevalence Index Worksheet</b> Total % Cover of: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>75</u> x 2 = <u>150</u> FAC species <u>95</u> x 3 = <u>285</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>170</u> (A) <u>435</u> (B) Prevalence Index = B/A = <u>2.56</u>
		<u>60</u>	<u>= Total Cover</u>		
<b>Sapling/Shrub stratum</b> (Plot size: <u>          </u> )					
1	<u>Acer negundo</u>	<u>10</u>	<u>Y</u>	<u>FACW</u>	
2	<u>Lonicera morrowii</u>	<u>          </u>	<u>          </u>	<u>NI</u>	
3	<u>Fraxinus pennsylvanica</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>	
4	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	<b>Hydrophytic Vegetation Indicators:</b> Rapid test for hydrophytic vegetation <input checked="" type="checkbox"/> Dominance test is >50% <input checked="" type="checkbox"/> Prevalence index is ≤3.0* Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) Problematic hydrophytic vegetation* (explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
5	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	
		<u>15</u>	<u>= Total Cover</u>		
<b>Herb stratum</b> (Plot size: <u>          </u> )					
1	<u>Zizia aurea</u>	<u>95</u>	<u>Y</u>	<u>FAC</u>	
2	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	<b>Hydrophytic vegetation present?</b> <u>Y</u>
3	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	
4	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	
5	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	
6	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	
7	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	<b>Woody vine stratum</b> (Plot size: <u>          </u> )
8	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	
9	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	
10	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	
		<u>95</u>	<u>= Total Cover</u>		
1	<u>Toxicodendron radicans subsp. negundo</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	<b>Hydrophytic vegetation present?</b> <u>Y</u>
2	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>	
		<u>5</u>	<u>= Total Cover</u>		

Remarks: (Include photo numbers here or on a separate sheet)

## SOIL

Sampling Point: WD-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 3/2	90	7.5 YR 5/6	10	RM	M	SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

## Hydric Soil Indicators:

- ☐ Histisol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☐ 2 cm Muck (A10)  
☒ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Loamy Mucky Mineral (F1)  
☐ Loamy Gleyed Matrix (F2)  
☐ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

## Indicators for Problematic Hydric Soils:

- ☐ Coast Prairie Redox (A16) (LRR K, L, R)  
☐ Dark Surface (S7) (LRR K, L)  
☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  
☐ Iron-Manganese Masses (F12) (LRR K, L, R)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (explain in remarks)

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

## Restrictive Layer (if observed):

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric soil present? Y

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☒ Surface Water (A1)  
☒ High Water Table (A2)  
☐ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☒ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☒ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)  
☐ True Aquatic Plants (B14)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Oxidized Rhizospheres on Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Recent Iron Reduction in Tilled Soils (C6)  
☐ Thin Muck Surface (C7)  
☐ Gauge or Well Data (D9)  
☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface water present? Yes        No X Depth (inches):         
 Water table present? Yes X No        Depth (inches): 12  
 Saturation present? Yes X No        Depth (inches):         
 (includes capillary fringe)

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-4  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): None  
 Slope (%): 0 Lat: 39.716839 Long: 86.064706 Datum: WGS84  
 Soil Map Unit Name Brookston silty clay loam NWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation       , soil       , or hydrology        significantly disturbed? Are "normal circumstances"       

Are vegetation       , soil       , or hydrology        naturally problematic? present? Yes

## SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	<u>Y</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: <u>      </u>
Hydric soil present?	<u>N</u>	
Wetland hydrology present?	<u>N</u>	
Remarks: (Explain alternative procedures here or in a separate report.)		

## VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status
1	<i>Carya ovata</i>	70	Y	FACU
2	<i>Fraxinus pennsylvanica</i>	20	Y	FACW
3				
4				
5				
		90	= Total Cover	
Sapling/Shrub stratum	(Plot size: <u>      </u> )			
1	<i>Lonicera morrowii</i>			NI
2				
3				
4				
5				
		0	= Total Cover	
Herb stratum	(Plot size: <u>      </u> )			
1	<i>Lonicera morrowii</i>			NI
2	<i>Parthenocissus quinquefolia</i>	70	Y	FAC
3	<i>Toxicodendron radicans subsp. negundo</i>	10	N	FAC
4				
5				
6				
7				
8				
9				
10				
		80	= Total Cover	
Woody vine stratum	(Plot size: <u>      </u> )			
1				
2				
		0	= Total Cover	

### Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 66.67% (A/B)

### Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	80	x 3 =	240
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column totals	170	(A)	560 (B)

Prevalence Index = B/A = 3.29

### Hydrophytic Vegetation Indicators:

       Rapid test for hydrophytic vegetation

X Dominance test is >50%

       Prevalence index is ≤3.0\*

       Morphological adaptations\* (provide supporting data in Remarks or on a separate sheet)

       Problematic hydrophytic vegetation\* (explain)

\*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

### Hydrophytic vegetation present?

Y

Remarks: (Include photo numbers here or on a separate sheet)

## SOIL

Sampling Point: WD-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 3/3	100					SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

## Hydric Soil Indicators:

- ☐ Histisol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☐ 2 cm Muck (A10)  
☐ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Loamy Mucky Mineral (F1)  
☐ Loamy Gleyed Matrix (F2)  
☐ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

## Indicators for Problematic Hydric Soils:

- ☐ Coast Prairie Redox (A16) (LRR K, L, R)  
☐ Dark Surface (S7) (LRR K, L)  
☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  
☐ Iron-Manganese Masses (F12) (LRR K, L, R)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (explain in remarks)

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric soil present? N

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)  
☐ High Water Table (A2)  
☐ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)  
☐ True Aquatic Plants (B14)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Oxidized Rhizospheres on Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Recent Iron Reduction in Tilled Soils (C6)  
☐ Thin Muck Surface (C7)  
☐ Gauge or Well Data (D9)  
☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface water present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 Water table present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 Saturation present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-5  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): Slight Convex  
 Slope (%): 0 Lat: 39.716872 Long: 86.064478 Datum: WGS84  
 Soil Map Unit Name Brookston silty clay loam NWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation       , soil       , or hydrology        significantly disturbed?

Are "normal circumstances"

Are vegetation       , soil       , or hydrology        naturally problematic?

present? Yes

## SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: <u>      </u>
Hydric soil present? <u>N</u>	
Wetland hydrology present? <u>N</u>	
Remarks: (Explain alternative procedures here or in a separate report.)	

## VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status
1 <u>Carya ovata</u>		50	Y	FACU
2				
3				
4				
5				
		50	= Total Cover	
Sapling/Shrub stratum	(Plot size: <u>      </u> )			
1 <u>Lonicera morrowii</u>				NI
2				
3				
4				
5				
		0	= Total Cover	
Herb stratum	(Plot size: <u>      </u> )			
1 <u>Lonicera morrowii</u>				NI
2 <u>Parthenocissus quinquefolia</u>		10	Y	FAC
3 <u>Toxicodendron radicans subsp. negundo</u>		10	Y	FAC
4				
5				
6				
7				
8				
9				
10				
		20	= Total Cover	
Woody vine stratum	(Plot size: <u>      </u> )			
1				
2				
		0	= Total Cover	

### Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 66.67% (A/B)

### Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column totals	70	(A)	260 (B)

Prevalence Index = B/A = 3.71

### Hydrophytic Vegetation Indicators:

       Rapid test for hydrophytic vegetation

X Dominance test is >50%

       Prevalence index is ≤3.0\*

       Morphological adaptations\* (provide supporting data in Remarks or on a separate sheet)

       Problematic hydrophytic vegetation\* (explain)

\*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

### Hydrophytic vegetation present?

Y

Remarks: (Include photo numbers here or on a separate sheet)

## SOIL

Sampling Point: WD-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 3/3	100					SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

## Hydric Soil Indicators:

- ☐ Histisol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☐ 2 cm Muck (A10)  
☐ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ 5 cm Mucky Peat or Peat (S3)

- ☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Loamy Mucky Mineral (F1)  
☐ Loamy Gleyed Matrix (F2)  
☐ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

## Indicators for Problematic Hydric Soils:

- ☐ Coast Prairie Redox (A16) (LRR K, L, R)  
☐ Dark Surface (S7) (LRR K, L)  
☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  
☐ Iron-Manganese Masses (F12) (LRR K, L, R)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (explain in remarks)

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric soil present? N

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)  
☐ High Water Table (A2)  
☐ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Water-Stained Leaves (B9)

Secondary Indicators (minimum of two required)

- ☐ Aquatic Fauna (B13)  
☐ True Aquatic Plants (B14)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Oxidized Rhizospheres on Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Recent Iron Reduction in Tilled Soils (C6)  
☐ Thin Muck Surface (C7)  
☐ Gauge or Well Data (D9)  
☐ Other (Explain in Remarks)
- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface water present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 Water table present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 Saturation present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-6  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): Convex  
 Slope (%): 0 Lat: 39.71675 Long: 86.064581 Datum: WGS84  
 Soil Map Unit Name Urban Land-Brookston Complex NWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation           , soil           , or hydrology            significantly disturbed?

Are "normal circumstances"

Are vegetation           , soil           , or hydrology            naturally problematic?

present? Yes

## SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: <u>                    </u>
Hydric soil present? <u>N</u>	
Wetland hydrology present? <u>N</u>	
Remarks: (Explain alternative procedures here or in a separate report.)	

## VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>                    </u> )	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
		0	= Total Cover	
Sapling/Shrub stratum	(Plot size: <u>                    </u> )			
1	<i>Acer negundo</i>	20	Y	FACW
2	<i>Lonicera morrowii</i>			NI
3				
4				
5				
		20	= Total Cover	
Herb stratum	(Plot size: <u>                    </u> )			
1	<i>Hydrophyllum virginianum</i>	20	Y	FACW
2	<i>Zizia aurea</i>	10	Y	FAC
3	<i>Lonicera morrowii</i>			NI
4				
5				
6				
7				
8				
9				
10				
		30	= Total Cover	
Woody vine stratum	(Plot size: <u>                    </u> )			
1		5	Y	
2				
		5	= Total Cover	

### Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 4 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 75.00% (A/B)

### Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	50	(A)	110 (B)

Prevalence Index = B/A = 2.20

### Hydrophytic Vegetation Indicators:

       Rapid test for hydrophytic vegetation

X Dominance test is >50%

X Prevalence index is ≤3.0\*

       Morphological adaptations\* (provide supporting data in Remarks or on a separate sheet)

       Problematic hydrophytic vegetation\* (explain)

\*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

### Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)



## SOIL

Sampling Point: WD-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 4/6	100					SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

## Hydric Soil Indicators:

- ☐ Histisol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☐ 2 cm Muck (A10)  
☐ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ 5 cm Mucky Peat or Peat (S3)

- ☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Loamy Mucky Mineral (F1)  
☐ Loamy Gleyed Matrix (F2)  
☐ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

## Indicators for Problematic Hydric Soils:

- ☐ Coast Prairie Redox (A16) (LRR K, L, R)  
☐ Dark Surface (S7) (LRR K, L)  
☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  
☐ Iron-Manganese Masses (F12) (LRR K, L, R)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (explain in remarks)

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric soil present? N

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)  
☐ High Water Table (A2)  
☐ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Water-Stained Leaves (B9)

Secondary Indicators (minimum of two required)

- ☐ Aquatic Fauna (B13)  
☐ True Aquatic Plants (B14)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Oxidized Rhizospheres on Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Recent Iron Reduction in Tilled Soils (C6)  
☐ Thin Muck Surface (C7)  
☐ Gauge or Well Data (D9)  
☐ Other (Explain in Remarks)
- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface water present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 Water table present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 Saturation present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-7  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): None  
 Slope (%): 0 Lat: 39.717581 Long: 86.064564 Datum: WGS84  
 Soil Map Unit Name Urban Land-Crosby Complex NWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation       , soil       , or hydrology        significantly disturbed? Are "normal circumstances"

Are vegetation       , soil       , or hydrology        naturally problematic? present? Yes

## SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u> If yes, optional wetland site ID: <u>Wetland Area 3</u>
Hydric soil present? <u>Y</u>	
Wetland hydrology present? <u>Y</u>	
Remarks: (Explain alternative procedures here or in a separate report.)	

## VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Dominance Test Worksheet</b> Number of Dominant Species that are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across all Strata: <u>3</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
1 <u>Fraxinus pennsylvanica</u>	30	Y	FACW	
2 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
30 = Total Cover				
Sapling/Shrub stratum (Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Prevalence Index Worksheet</b> Total % Cover of: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>60</u> x 2 = <u>120</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>60</u> (A) <u>120</u> (B) Prevalence Index = B/A = <u>2.00</u>
1 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
2 <u>Acer negundo</u>	25	Y	FACW	
3 <u>Lonicera morrowii</u>	<u>      </u>	<u>      </u>	NI	
4 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
25 = Total Cover				
Herb stratum (Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Hydrophytic Vegetation Indicators:</b> <u>      </u> Rapid test for hydrophytic vegetation <u>X</u> Dominance test is >50% <u>X</u> Prevalence index is ≤3.0* Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) Problematic hydrophytic vegetation* (explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1 <u>Fraxinus pennsylvanica</u>	5	Y	FACW	
2 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
6 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
7 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
8 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
9 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
10 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5 = Total Cover				
Woody vine stratum (Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Hydrophytic vegetation present?</b> <u>Y</u>
1 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
2 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
0 = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet)

## SOIL

Sampling Point: WD-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 3/2	95	10 YR 5/6	5	RM	M	SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

## Hydric Soil Indicators:

- |   |   |
|---|---|
| <input type="checkbox"/> Histisol (A1)                                | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)                         | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                            | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                        | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)                       | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                              | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)                     | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                     | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)                 |   |

## Indicators for Problematic Hydric Soils:

- |   |
|---|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)    |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L)               |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)  |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12)           |
| <input type="checkbox"/> Other (explain in remarks)                 |

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

## Restrictive Layer (if observed):

 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_
Hydric soil present? Y

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |  |   |
|--|---|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input checked="" type="checkbox"/> Drift Deposits (B3)            | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks)                 |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   |
| <input type="checkbox"/> Water-Stained Leaves (B9)                 |   |

Secondary Indicators (minimum of two required)

- |  |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Geomorphic Position (D2)                  |
| <input type="checkbox"/> FAC-Neutral Test (D5)                     |

## Field Observations:

Surface water present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches): _____
Water table present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches): _____
Saturation present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches): _____

 (includes capillary fringe)
Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-8  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): Slight Concave  
 Slope (%): 0 Lat: 39.717161 Long: 86.063864 Datum: WGS84  
 Soil Map Unit Name Urban Land-Crosby Complex NWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation           , soil           , or hydrology            significantly disturbed?

Are "normal circumstances"

Are vegetation           , soil           , or hydrology            naturally problematic?

present? Yes

## SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u> If yes, optional wetland site ID: <u>Wetland Area 4</u>
Hydric soil present? <u>Y</u>	
Wetland hydrology present? <u>Y</u>	
Remarks: (Explain alternative procedures here or in a separate report.)	

## VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>          </u> )	Absolute % Cover	Dominant Species	Indicator Status
1	<u>Fraxinus pennsylvanica</u>	<u>45</u>	<u>Y</u>	<u>FACW</u>
2	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>
3	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>
4	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>
5	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>
		<u>45</u>	<u>= Total Cover</u>	
Sapling/Shrub stratum	(Plot size: <u>          </u> )			
1	<u>Lonicera morrowii</u>			<u>NI</u>
2	<u>Acer negundo</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>
3	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>
4	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>
5	<u>                                  </u>	<u>          </u>	<u>          </u>	<u>          </u>
		<u>20</u>	<u>= Total Cover</u>	
Herb stratum	(Plot size: <u>          </u> )			
1	<u>                                  </u>			
2	<u>                                  </u>			
3	<u>                                  </u>			
4	<u>                                  </u>			
5	<u>                                  </u>			
6	<u>                                  </u>			
7	<u>                                  </u>			
8	<u>                                  </u>			
9	<u>                                  </u>			
10	<u>                                  </u>			
		<u>0</u>	<u>= Total Cover</u>	
Woody vine stratum	(Plot size: <u>          </u> )			
1	<u>                                  </u>			
2	<u>                                  </u>			
		<u>0</u>	<u>= Total Cover</u>	

### Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

### Prevalence Index Worksheet

Total % Cover of:

OBL species	<u>0</u>	x 1 =	<u>0</u>
FACW species	<u>65</u>	x 2 =	<u>130</u>
FAC species	<u>0</u>	x 3 =	<u>0</u>
FACU species	<u>0</u>	x 4 =	<u>0</u>
UPL species	<u>0</u>	x 5 =	<u>0</u>
Column totals	<u>65</u>	(A)	<u>130</u> (B)

Prevalence Index = B/A = 2.00

### Hydrophytic Vegetation Indicators:

       Rapid test for hydrophytic vegetation

X Dominance test is >50%

X Prevalence index is ≤3.0\*

       Morphological adaptations\* (provide supporting data in Remarks or on a separate sheet)

       Problematic hydrophytic vegetation\* (explain)

\*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

### Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

September 12, 2011

2003-1046-00

Mr. Jonathan Adenuga  
United States Environmental Protection Agency, Region 5  
Corrective Action Branch  
77 West Jackson Boulevard  
Chicago, IL 60604-3590

RE: Corrective Measures Implementation  
Refined Metals Facility  
Beech Grove, Indiana  
IND 000 718 130

Dear Jonathan:

At the request of Refined Metals Corporation (RMC), I am drafting this letter to document your telephone conversation with Matthew Love regarding Corrective Measures Implementation at the RMC facility in Beech Grove, Indiana. As you discussed with Matt Love, we have reached a point in the calendar where we no longer believe that it is realistic to expect we can complete remediation and restoration activities before the onset of winter. At this time, we still have the following open issues that are preventing or delaying the start of construction:

1. We were required to complete an updated wetland delineation for the site. The delineation was completed in late July/early August and at this time we are awaiting completion of a Jurisdictional Determination by the Army Corps of Engineers to confirm that a small area of isolated wetlands identified in the mowed lawn area near Arlington Avenue is not subject to regulation.
2. We are still awaiting access from the CSX Railroad for remediation of the drainage ditch within their right-of-way at the north end of the RMC property.
3. Final approval of the Drainage Permit from the City of Indianapolis is held up pending approval of an Easement by RMC to the City of Indianapolis.
4. RMC is awaiting final comments and approval from Citizens Gas for excavation and restoration activities to be completed on their property

Instead of starting construction activities in October 2011, shutting down for December through March with a disturbed site and then resuming construction in April 2012, we will be delaying the start of construction until mid-April 2012 with an eye towards completion by July/August 2012. We believe that delaying the start date will allow RMC to fully address the open issues cited above, and allow the site to remain undisturbed through the winter period, and allow work to proceed in more favorable weather conditions.





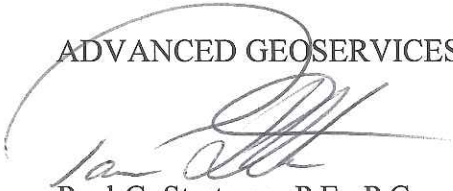


Mr. Jonathan Adenuga  
2003-1046-00  
September 12, 2011  
Page 2 of 2

It is our understanding that you concur with this decision. If you have any questions or comments, please contact Paul Stratman at 610-840-9122 or Matthew Love at 610-921-4054.

Sincerely,

ADVANCED GEOSERVICES CORP.



Paul G. Stratman, P.E., P.G.  
Senior Project Consultant

PGS:vm

Enclosures

cc: Ruth Jean  
Matthew Love





**Refined Metals - Soil from Pipeline Excavation**

LOVE, Matt (Reading Equipment Center)

To: Jonathan Adenuga, JEAN, RUTH

Cc: Paul Stratman

06/12/2012 10:49 AM

Jonathan and Ruth,

Per Jonathan's request this morning, I contacted the pipeline company that performed repairs in the drainage ditch in front of the Refined Metals facility and asked what happened to the soil they excavated. The pipeline company said the gas company took it and that's all they knew. The pipeline company said they'd pass my phone number on to the gas company and request that someone from the gas company contact me. I'll let you know what the gas company says when they get back to me.

Matt

---

This message (including any attachments) may contain protected information and is intended only for the individual(s) named. If you are not a named addressee you should not disseminate, distribute or copy this e-mail. If you have received this e-mail in error, please notify sender by e-mail and delete this e-mail.





September 12, 2011

2003-1046-00

Mr. Jonathan Adenuga  
United States Environmental Protection Agency, Region 5  
Corrective Action Branch  
77 West Jackson Boulevard  
Chicago, IL 60604-3590

RE: Corrective Measures Implementation  
Refined Metals Facility  
Beech Grove, Indiana  
IND 000 718 130

Dear Jonathan:

At the request of Refined Metals Corporation (RMC), I am drafting this letter to document your telephone conversation with Matthew Love regarding Corrective Measures Implementation at the RMC facility in Beech Grove, Indiana. As you discussed with Matt Love, we have reached a point in the calendar where we no longer believe that it is realistic to expect we can complete remediation and restoration activities before the onset of winter. At this time, we still have the following open issues that are preventing or delaying the start of construction:

1. We were required to complete an updated wetland delineation for the site. The delineation was completed in late July/early August and at this time we are awaiting completion of a Jurisdictional Determination by the Army Corps of Engineers to confirm that a small area of isolated wetlands identified in the mowed lawn area near Arlington Avenue is not subject to regulation.
2. We are still awaiting access from the CSX Railroad for remediation of the drainage ditch within their right-of-way at the north end of the RMC property.
3. Final approval of the Drainage Permit from the City of Indianapolis is held up pending approval of an Easement by RMC to the City of Indianapolis.
4. RMC is awaiting final comments and approval from Citizens Gas for excavation and restoration activities to be completed on their property

Instead of starting construction activities in October 2011, shutting down for December through March with a disturbed site and then resuming construction in April 2012, we will be delaying the start of construction until mid-April 2012 with an eye towards completion by July/August 2012. We believe that delaying the start date will allow RMC to fully address the open issues cited above, and allow the site to remain undisturbed through the winter period, and allow work to proceed in more favorable weather conditions.



Mr. Jonathan Adenuga  
2003-1046-00  
September 12, 2011  
Page 2 of 2

It is our understanding that you concur with this decision. If you have any questions or comments, please contact Paul Stratman at 610-840-9122 or Matthew Love at 610-921-4054.

Sincerely,

ADVANCED GEOSERVICES CORP.



Paul G. Stratman, P.E., P.G.  
Senior Project Consultant

PGS:vm

Enclosures

cc: Ruth Jean  
Matthew Love

March 10, 2011

2003-1046-00

Mr. Jonathan Adenuga  
Corrective Action Branch  
Environmental Protection Agency, Region 5  
77 West Jackson Boulevard  
Chicago, IL 60604-3590

RE: Response to EPA's Comments for CMS Report  
Refined Metals Facility  
Beech Grove, Indiana  
IND 000 718 130

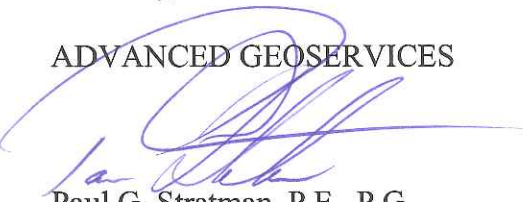
Dear Jonathan:

I am sending this letter to document our telephone conversation of earlier today regarding submission of the response to comments contained in your comment letter received on February 8, 2011. Pursuant to that conversation, Refined Metals Corporation is granted an 11 day extension for submission of the required response from March 10, 2011 to March 21, 2011.

If you have any questions, please contact Paul Stratman at 610-840-9122 or Matthew Love at 610-921-4054.

Sincerely,

ADVANCED GEOSERVICES



Paul G. Stratman, P.E., P.G.  
Senior Project Consultant

PGS:vm

cc: Ruth Jean  
Matthew Love







Jonathan Adenuga to: kdaily

07/12/2011 10:13 AM

Hello Kerry, as I mentioned to you recently (7/11/11) that your name came up as the individual who provided comments to the drainage permit submitted for the Refined Metals Corp. located in beech Grove, IN. I also indicated to you that I was going to contact IDEM to inquire whether or not there are other state jurisdictional issues that they might be concerned with. The name of the individual at IDEM involved with storm water issues/permit is Randy Braun whom I have also contacted. If he has not already contacted you, his phone No. is (317) 234-3980. Randy apparently knows you. I would hope that both of you would review any amendments to the permit submitted for all relevant technical details, jurisdictional issues and more importantly, what impacts if any the storm water basin will have on the onsite containment cell that is going to be constructed at the facility. Please keep me posted

Thank you

Jonathan Adenuga

(312) 886-7954



IDem Storm H2O Contact  
Randy Braun  
(317) 234-3980

CITY OF INDIANAPOLIS  
Technical review  
Kerry Daily (317)-266-8000







**Refined Metals Beech Grove Storm Water Management Basin and Drainage Permit from City**

**Paul Stratman** to: Jonathan Adenuga

07/08/2011 04:01 PM

Cc: matt.love

---

History: This message has been forwarded.

---

1 attachment



13-CROSS SECTION PLAN-CROSS SECTION.PDF

---

**Dear Jonathon:**

Advanced GeoServices Corp. is in the process of securing the Drainage Permit required by the City of Indianapolis for construction of the proposed Corrective Measures at the Refined Metals Corporation (RMC) facility in Beech Grove, Indiana. The original submission was made on June 7, 2011 and comments were received on June 21, 2011. The majority of the comments were relatively straight forward and can be addressed with no substantive changes to the approved Corrective Measures Design. However, there is one comment that we believe should be discussed with you before we proceed with changes to the design. The comment provided by Mr. Kerry Daily, the technical review for the City (317-266-8000 or [kdaily@cbbel-in.com](mailto:kdaily@cbbel-in.com)) is as follows

***The design of the dry pond should include a low-flow channel with an underdrain to allow the pond to dry out between storm events.***

The comment relates to either increasing bottom grading in the SWM Basin to 2% to minimize the potential for standing water or installing the under-drain to facilitate drainage of the basin. Ultimately, the requirement is intended to ensure that the SWM Basin will be sufficiently dry and can be maintained. We have evaluated the feasibility of increasing the bottom slope in the SWM Basin to 2% and the alternative of providing an under-drain. Unfortunately, because of the very flat slopes at the site we do not have enough vertical relief to allow us to provide the under-drain or 2% slopes while also maintaining sufficient **storage capacity** in the SWM Basin necessary for storm water detention.

Under the Stormwater Specifications Manual, we also have the option of utilizing a wet basin. A wet basin recognizes that in some situations an SWM Basin will be difficult to drain due to very flat slope or similar constraints and instead of attempting to create a dry bottom that will be likely wet or soggy the majority of the time, it is designed to retain water on a permanent basis while providing wetland plantings to enhance water quality. Based on our design evaluation we can create a wet basin design in the vicinity of the SWM Basin outlet structure while providing a dry basin configuration between the sediment forebay and the wet basin. As shown on the attached Figure, the wet basin will have a maximum standing water surface elevation of 837.25 and water surface area of approximately 4,300 sf (0.1 acres).

The maximum standing water surface elevation is equal to the invert elevation of the outlet structure from the approved Corrective Measures Design. This means that the vertical separation between the maximum standing water surface elevation and bottom of the

Containment Cell will be 4.25 ft (841.5 – 837.25), which is the same as the separation would have been during high groundwater periods under the approved design, and greater than the vertical separation in the sediment forebay of 3.0 ft (841.5 – 838.5 (forebay overflow pipe invert)). The elevation of the 225 ft long emergency spillway will be 840.25 which means water surface elevation in the basin cannot reach 841.5. The cross-section provided on the attached Figure depicts the relationship between the proposed wet pond and the bottom of the Containment Cell.

As explained above, utilization of the wet pond area in the SWM Basin will not change the relationship between water surface elevations in the SWM Basin and the bottom of waste elevation in the Containment Cell. Through this submission we respectfully request your approval of this design modification for the proposed Corrective Measures at the Refined Metals Beech grove Site.

If you have any questions, please contact me at 610-840-9122. As discussed we are available to participate in a conference call on Modany to discuss further.

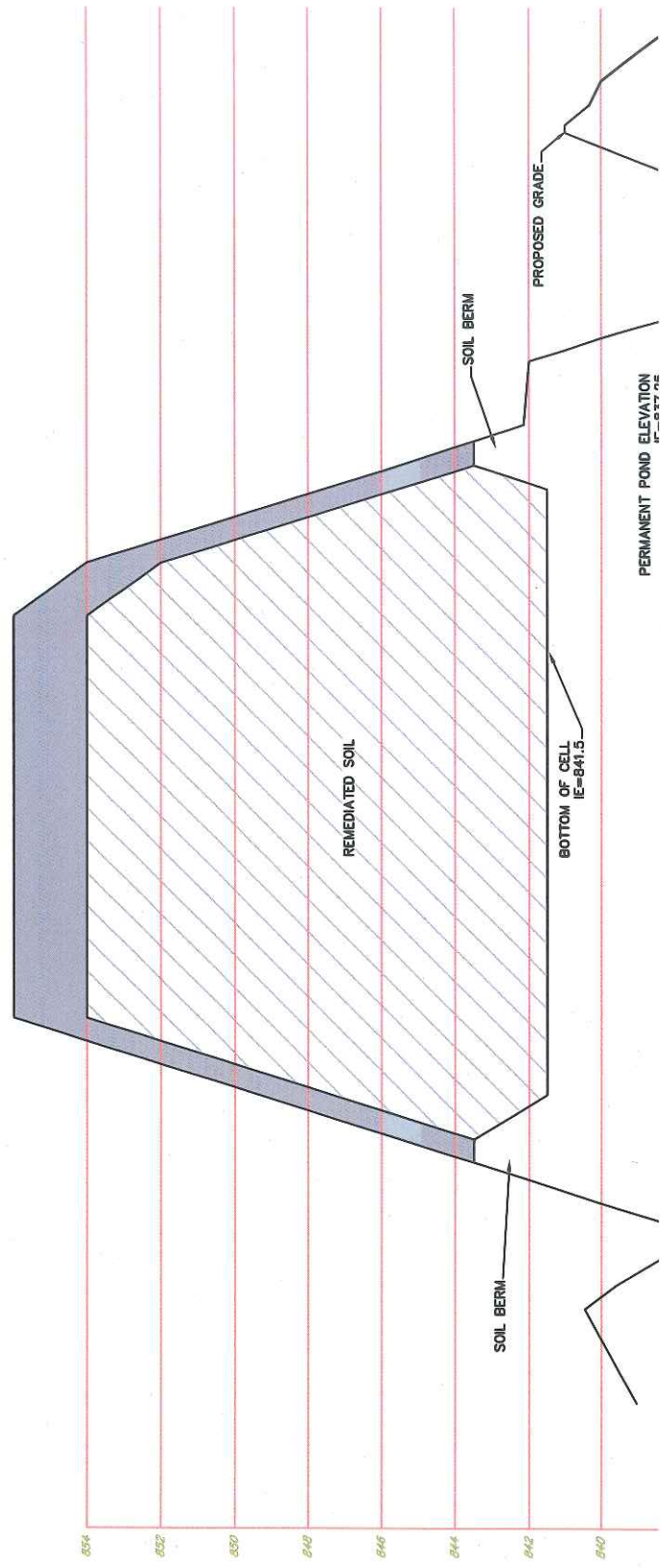
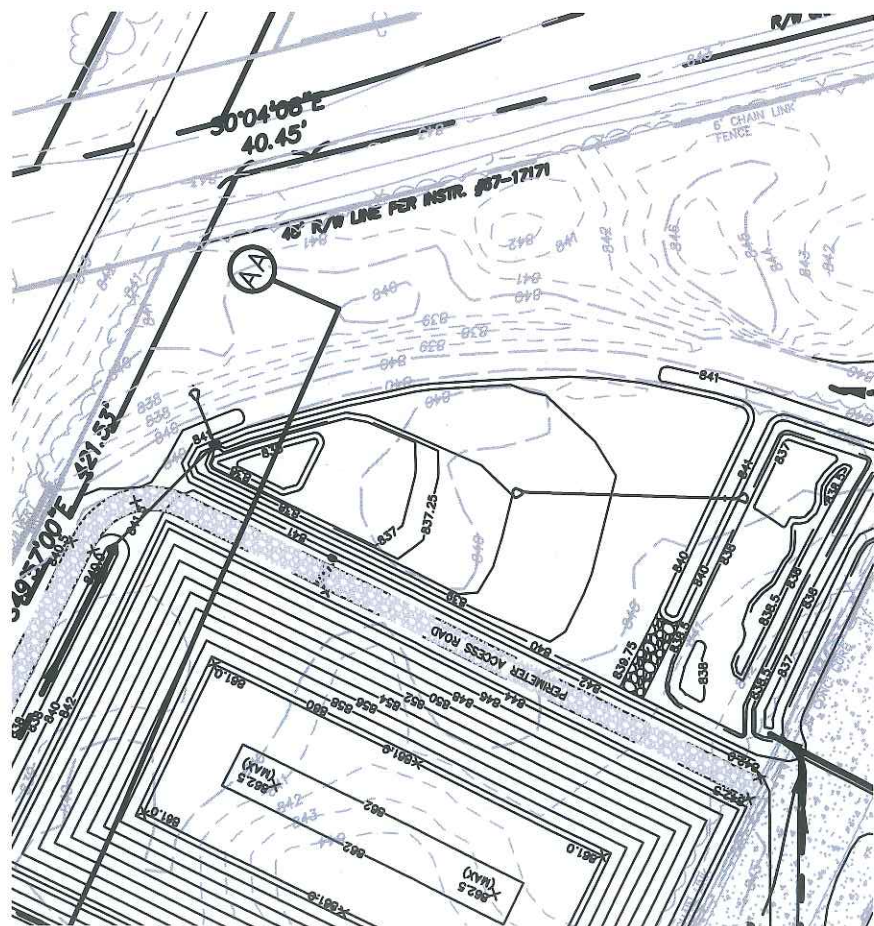
Thank you,

Have a good weekend.

Paul G. Stratman,  
Senior Project Consultant  
**Advanced GeoServices**  
*"Engineering for the Environment. Planning for People."*<sup>TM</sup>  
1055 Andrew Drive, Suite A  
West Chester, PA 19380-4293  
**Direct** 610.840.9122 **Fax** 610.840.9199  
**Email** [pgstratman@advancedgeoservices.com](mailto:pgstratman@advancedgeoservices.com)  
**Web Site** <http://www.advancedgeoservices.com>

This message contains information that may be confidential or privileged. Unless you are the addressee (or authorized to receive for the addressee), you may not use, copy, or disclose to anyone this message or any information contained in the message. If you have received this message in error, please advise the sender by reply e-mail and delete all copies of this message and its attachments.





10'

## ATTACHMENT

**Evaluation of Response to General Comment (GC) 1a:** The response partially addresses the comment. However, key elements of *EPA Requirements for Quality Assurance Project Plans*, dated March 2001 (EPA QA/R-5) have not been addressed in the QAPP. For example, the Quality Assurance Project Plan (QAPP) does not contain all standard operating procedures (SOPs) that will be used (e.g., for validation, analysis, etc.). Further, some of the information presented in the QAPP is inconsistent with the information presented in the SAP and other sections of the CM Design. The following are examples of deficiencies and inconsistencies noted in the QAPP:

- a. Section 4.2 of the QAPP, entitled Verification and Validation Methods, does not contain all of the qualifiers presented in SAP Section 10.2, Data Validation Protocol. Revise the QAPP and/or SAP to address this discrepancy.
- b. Section 4.2 of the QAPP cites one SOP for data validation, while Section 10.2 of the SAP references two procedures. Revise the QAPP and/or SAP to address this discrepancy.
- c. Section 4.2 of the QAPP indicates that the Treatment System sample delivery groups (SDGs) will undergo a lesser quality assurance (QA) review, but this has not been discussed in the SAP. It is also unclear what SDGs this refers to and why a lesser QA review was selected. Revise the QAPP to address this discrepancy.
- d. Table 2, Data Quality Objectives, in the QAPP lists a relative percent difference (RPD) of 35 percent for matrix spike soil samples, but the method specified limit included in Table 12-1 of Attachment A, the Laboratory Quality Assurance Manual, is 20 percent. Revise the QAPP to address this discrepancy.
- e. The QAPP does not discuss and summarize the secondary data that was used for the project; however, Appendix A, Confirmatory Sampling, indicates that previously collected data was used. Revise the QAPP to summarize previously collected data, including any limitations on this data.
- f. The QAPP does not indicate whether soil samples will be reported on a dry weight basis and if criteria objectives listed in Table 1, Sampling Parameters and Reporting Limits, are dry weight corrected. Revise the QAPP to indicate that both soil results and project criteria objectives will be reported based on dry weight.
- g. The QAPP includes extraneous information regarding analyses and validation of organic methods, but the SAP indicates only inorganic analyses will be performed. For example, Section 2.4 of the QAPP indicates tentatively identified compounds (TICs) may be measured, Section 4.2 of the QAPP discusses QA review of organic data, and data validation checklists are provided for semi-volatile organic compounds (SVOCs) and volatile organic compounds (VOCs). Revise the QAPP to remove extraneous information.

Revise the QAPP to provide all SOPs referenced in the QAPP. Also, ensure the QAPP, SAP and CM Design present consistent information. Additional examples of missing EPA QA/R-5 elements are also included in the following comments.



**Evaluation of Response to GC 1b:** The response does not address the comment. The data quality objectives (DQOs) discussed in Section 1.4 of the QAPP do not provide sufficient detail when compared to EPA's DQO guidance document, *Guidance on Systematic Planning using the Data Quality Objectives Process (QA/G-4)*, dated February 2006 and EPA QA/R-5, Section 3.2.7, A7 - Quality Objectives and Criteria. The DQO section should clearly define the problem and the environmental questions that will be answered for the current investigation, including the previous data that has been collected for the site. Project decision "If..., then..." statements should be included, linking data results with possible actions. The DQOs should also identify the type, quantity, and quality of data needed to answer the study questions. Although some of this information may be located in the CM Design (e.g., the if/then statements for confirmatory sampling and the specific cleanup criteria for backfill included in Appendix A), this information should be added to the QAPP and summarized in a table to make the QAPP a more useful field document. Revise the QAPP to contain detailed DQOs to ensure that the environmental problems are adequately addressed and informed decisions can be made in the field.

**Evaluation of Response to GC 1c:** The response does not address the comment. The response indicates that certain sections in the SAP contain the rationale for the design of the proposed soil and groundwater sampling. However, the referenced sections do not appear to contain sufficient information and instead reference other pieces of the CM Design. The following are several examples where additional information is necessary:

- a. The response indicates that Section 5.3 of the SAP contains the rationale for the stockpile sampling, but this section references the CM Design for the rationale and design. It is unclear where in the CM Design this information may be found (i.e., why collecting one composite sample of four aliquots per 250 cubic yards will sufficiently determine that metals concentrations are below cleanup criteria). Revise the QAPP to justify why this amount of sampling is sufficient to meet project goals.
- b. The response states that the rationale for the containment cell groundwater sampling is provided in Section 5.6 of the SAP, but this section references Section 5.5.1 of the CM Design Report and Sections 2.6 and 4.2 of the Operations and Maintenance Plan. However, neither of these sections indicates why the proposed number and location of wells is sufficient to detect a release from the containment cell. Additionally, it is unclear why quarterly sampling for two years followed by semi-annual sampling for two years and then annual sampling was selected for the monitoring frequency. Revise the QAPP to justify why the proposed sampling is sufficient to meet project goals.
- c. The design and rationale for the confirmatory sampling references Chapter 6 of the IDEM RISC Technical Guide (RISC Guide); however, additional detail is necessary to justify the sampling approach. Section 6.3 of the RISC Guide explains that random soil sampling for closure should consider the coefficient of variation (CV), and notes that additional samples or additional actions may be required if the CV is greater than 1.2. Additionally, Section 6.3.1 of the RISC Guide indicates that the upper confidence level (UCL) of the average concentration is used to determine closure. It is unclear if this statistical approach will be used for determining if additional excavation is

required or if closure is complete. Revise the QAPP to explain the rationale for the confirmatory sampling approach in greater detail.

**Evaluation of Response to GC 1d:** The response and information presented in Attachment B of the QAPP does not address the comment. The data validation checklists provided as Attachment B of the QAPP do not include the acceptance limits that will be used to validate data or how/when the associated qualifiers will be used when exceedances of control limits occur. Revise the QAPP to either indicate that the EPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review will be used as written (i.e., not modified for SW-846 method) or provide a checklist that includes details on how samples will be qualified (e.g., the control limits and associated qualifiers for exceedances that will be used during data validation).

**Evaluation of Response to GC 1e:** The response appears adequate; however this information should be added to Section 1.6, Documents and Records, of the QAPP. Additionally, Section 1.6 should include the monthly reports discussed in QAPP Section 3.2, Reports to Management. Revise Section 1.6 of the QAPP to include the information discussed in this response and the monthly reports discussed in Section 3.2.

**Evaluation of Response to Specific Comment (SC) 3:** The response partially addresses the comment. The response indicates that the long, narrow excavations ND1 and ND2 will be sampled along the centerline of the removed soil. However, it is unclear what will be done to minimize clustering of sampling locations for these narrow excavations. For example, the three sample locations for ND1 could be preferentially located at one end of the excavation. To ensure sample locations are sufficient, the proposed sample locations on the grids should be depicted. Revise the SAP to include the proposed locations of the confirmatory samples.

**Evaluation of Response to SC 14:** The response addresses the comment; however, the addition of dissolved oxygen (DO) and oxygen reduction potential (ORP) to well stabilization parameters in Section 2.2.4.3 of the QAPP should also be made to Section 6.6.3 of the SAP. Revise this section of the SAP to include the well stabilization parameters provided in the QAPP.

May 25, 2010

2003-1046-18

Mr. Jonathan Adenuga  
U.S. Environmental Protection Agency  
77 West Jackson Boulevard  
Chicago, IL 60604-3590

RE: Response to Comments, Corrective Measures Design  
Refined Metals Corporation, Beech Grove, Indiana  
IND 000 718 130

Dear Mr. Adenuga:

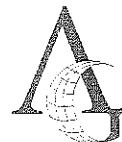
Advanced GeoServices, on behalf of Refined Metals Corporation (RMC), submits three (3) copies of the enclosed responses to comments on the Final Corrective Measures Design dated October 6, 2010, and revised on March 21, 2011 for the RMC Facility in Beech Grove, Indiana. The USEPA issued a comment letter dated May 3, 2011. This response has been prepared and is being issued in response to those comments.

For your convenience, your comment is provided in bold followed by our response.

**Comment: Evaluation of Response to General Comment (GC) 1a: The response does not address the comment. The response indicates that Appendix D, Sampling and Analysis Plan, of Attachment D, Construction Quality Assurance Plan (hereinafter referred to as SAP) provides the quality assurance project plan (QAPP) components. However, the SAP does not present all information required to be presented in a QAPP. Further, please note that the previous comments provided only examples of deficiencies when comparing to the SAP to *EPA Requirements for Quality Assurance Project Plans*, dated March 2001 (EPA QA/R-5), and were not intended to be an all inclusive comparison. A QAPP, which presents all of the information contained in the *EPA Requirements for Quality Assurance Project Plans*, dated March 2001 (EPA QA/R-5) should be prepared and submitted for review. Where applicable, the QAPP may reference the SAP for required information.**

Additionally, the response indicates that Attachment A of the SAP contains laboratory standard operating procedures, method detection limits, and quality control acceptance criteria; however, Attachment A of the SAP has not been provided. Revise the SAP to provide Attachment A.





Mr. Jonathan Adenuga  
2003-1046-18  
June 2, 2011  
Page 2 of 5

**Response:** A new QAPP has been prepared and the laboratory Quality Assurance Manual has been provided as Attachment A of the QAPP.

**Comment:** **Evaluation of Response to GC 1b:** The response does not address the comment. The response indicates that data quality objectives (DQOs) were provided in Table 2 of the SAP; however, the DQOs listed in Table 2 do not provide the level of information necessary in a QAPP. Revise the SAP to present detailed DQOs, consistent with EPA's *Guidance on Systematic Planning Using the Data Quality Objective Process* (EPA QA/G-4).

**Response:** DQOs are presented in Section 1.4 of the QAPP.

**Comment:** **Evaluation of Response to GC 1c:** The response partially addresses the comment. The referenced sections provide the sampling design. However, the rationale for why the sampling design is sufficient to meet study goals is not provided. Revise the SAP to provide a rationale for all sampling which discusses why the proposed sample numbers, types, locations and analyses are sufficient to meet study goals.

**Response:** Section 5.1 of the SAP has been revised to provide the Rationale for confirmatory sampling. Appendix A "Confirmatory Sampling" of the CQAP already discusses the basis for limiting sample analysis to only lead outside the HWMUs and including antimony, arsenic, cadmium and selenium, in addition to lead, within the HWMUs. Rationale for stockpile sampling have been added to Section 5.3 of the SAP. Rationale regarding groundwater sampling for the Containment cell groundwater wells has been added to Section 5.6 of the SAP. Rationale regarding the location of groundwater samples to be collected for MNA groundwater monitoring has been added to Section 5.7 of the SAP. Additional rationale regarding the sufficiency of MNA groundwater monitoring to meet study goals is provided in the MNA work plan which is referenced in Section 5.7 of the SAP.

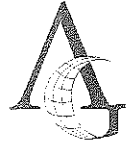
**Comment:** **Evaluation of Response to GC 1d:** The response partially addresses the comment. The response indicates that Attachment B of the SAP contains a typical data validation checklist; however, Attachment B of the SAP has not been provided. Revise the SAP to provide data validation checklists for all proposed analyses.

**Response:** Data validation checklists has been provided as Attachment B in the QAPP.

**Comment:** **Evaluation of Response to GC 1e:** The response partially addresses the comment. Although it is noted that the information included in data validation reports (DVRs) has been provided, it is unclear what will be







Mr. Jonathan Adenuga  
2003-1046-18  
June 2, 2011  
Page 3 of 5

**included in the project reports (e.g., field logs, laboratory data packages, DVRs, etc.). Further, the data reduction discussion does not indicate how analytical data will be incorporated into the final report. Revise the SAP to indicate what will be included in the project reports, and to provide a data reduction discussion which indicates how the analytical data will be incorporated into the final report.**

**Response:** Two types of project reports will be generated from the sampling activities covered by the SAP and QAPP. As previously described in Section 6.0 of the CQAP, confirmatory sampling performed as part of the remediation will be presented in the Final Certification Report and will include figures presenting the sample locations and tables presenting the corresponding results. The accompanying narrative will discuss where sample results required additional remediation and describe vertical and horizontal limits of the additional removal activities. The Final Certification Report will include electronic copies of the Data Validation Reports, XRF correlation information, and laboratory reports. Copies of the field logs will not be included in the Final Certification Report, but they are maintained as part of the project file if they are required for future reference.

As described in Section 6.0 of the MNA Work Plan, the Annual Groundwater report will include quarterly groundwater contour maps, additive results tables, groundwater purge sheets and statistical analysis. Electronic copies of the Data Validation Reports and laboratory reports will also be provided. Copies of the field logs will not be included in the Final Certification Report, but they are maintained as part of the project file if they are required for future reference.

**Comment:** **Evaluation of Response to SC 3 & Comment 7: The response to this comment is partially adequate; however, Sheet 8 does not appear to list the amount of confirmatory samples to be collected after excavation. Additionally, it is unclear how the 10-foot by 10-foot grid will be applied to oddly shaped areas (i.e., ND1 and ND2) and excavation areas greater than the grid area. Revise Sheet 8 to include the number of samples, and clarify how the grid sampling approach will be applied to each excavation area.**

**Response:** The Table of Sheet No. 8 of the design has been revised to show number of samples required within each excavation area. The grid is applied as an overlay that beginning ½ the grid width (in this project 5 feet) from reference sidewalls selected by the Technician at the time of sampling. Typically the reference sidewalls will be perpendicular sidewalls that are readily defined based on excavation configuration and physical features. For the oddly shaped excavations the Technician will attempt to get the maximum number of grid nodes in the





Mr. Jonathan Adenuga  
2003-1046-18  
June 2, 2011  
Page 4 of 5

bottom of the excavation. For an excavation such as ND1 or ND2 the Technician will treat the grid as being a single baseline along the centerline of the excavation. The above language has been added to Section 5.1 of the SAP.

**Comment:** Evaluation of Response to SC5 and 9: The response partially addresses the comment. The response indicates that Attachment C of the SAP contains manufacturer instructions for a Niton XRF unit; however, Attachment C of the SAP has not been provided. Revise the SAP to provide Attachment C.

**Response:** The Niton manufacturer's instructions have been included in the QAPP.

**Comment:** Evaluation of Response to SC11: The response partially addresses the comment. The text and tables indicate that zip lock baggies will be used for soil samples. However, Section 7.3 of the SAP indicates that samples will be placed on ice. Zip lock baggies may not be sufficient since the baggies may end up sitting in water from melted ice. The baggies can allow water infiltration over time which could result in cross contamination. Revise the SAP to ensure the potential for cross contamination will be eliminated.

**Response:** Section 7.3 of the SAP has been revised to clarify that ice is only required when shipping groundwater samples. In addition Section 7.3 has been revised to state that if soil samples in baggies are shipped with samples requiring ice, then the soil samples in baggies shall be double bagged to prevent infiltration of ice water into the soil sample.

**Comment:** Evaluation of Response to SC12: The response partially addresses the comment. Minimum sample volumes have been added to Table 3. However, the minimum sample size for many most soils is between 5-10 grams. To ensure that the laboratory has sufficient material to both properly subsample the soils, and re-prepare the soils if QC problems are encountered, it is recommended that at least 50 grams be collected. Revise the SAP to ensure that 50 grams will be collected for all analyses.

**Response:** Language specifying a minimum mass of 50 grams has been added to Section 6.1, 6.2 and 6.3 of the SAP.

**Comment:** Evaluation of Response to SC14: The response addresses the comment; however, further clarification is necessary.

- Section 6.6.2 of the SAP indicates that calibration of field instruments for groundwater monitoring activities will be conducted in accordance with manufacturer instructions, but these instructions have not been







Mr. Jonathan Adenuga  
2003-1046-18  
June 2, 2011  
Page 5 of 5

provided. Revise the SAP to provide the manufacturer instructions for all field instruments.

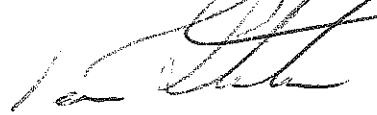
- Section 6.6.3 of the SAP indicates that well stabilization will be reached after conductivity, temperature, pH, and turbidity have reached certain criteria, but dissolved oxygen (DO) and oxygen reduction potential (ORP) have not been discussed. Revise the SAP to indicate the stabilization criteria that will be used for DO and ORP.

Response: The manufacturer's instructions for the LaMotte turbidimeter and YSI flow through cell have been included in the QAPP. DO and ORP have been included as part of the well stabilization criteria in the QAPP. These are the manufacturers we currently utilize, however; the reviewer must recognize that actual equipment utilized is subject to change. When/if equipment changes are anticipated, the EPA will be notified of such proposed changes and information for the new equipment submitted.

We believe this adequately responds to the comments contained in your May 3, 2011 letter. If you have any questions, please call me at 610-840-9122.

Sincerely,

ADVANCED GEOSERVICES CORP.

  
Paul G. Stratman, P.E., P.G.  
Senior Project Consultant



PGS:vm

Enclosures

cc: Matthew Love  
Ruth Jean





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5  
77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604-3590

5/3/2011

REPLY TO THE ATTENTION OF:

Matthew A. Love  
Manager-Regulatory Affairs  
Exide Corporation  
3000 Montrose Avenue  
Reading, PA 19605

Pre-Final Corrective Measures Design Work Plan  
Refined Metals Corporation  
IND 000 718 130

Dear Mr. Love:

The United States Environmental Protection Agency (U.S. EPA) has completed the review of the Response to Comments, dated March 21, 2011, for the Final Corrective Measure Design (Final CM Design) for the Refined Metals Corporation (RMC) facility located in Beech Grove, Indiana.

On January 4, 2011, EPA provided you with a conditional approval with the hope that RMC would be able to address all of EPA's comments. Based on our review, some of the EPA's comments have not been properly addressed. However, our desire is to see that the implementation of the proposed work in the CMI work plan begin as soon as possible. In that spirit we will provide you with another conditional approval. The enclosed attachment describes certain deficiencies noted in your March 2011 response. EPA is not opposed to RMC commencing work at the facility as long as the attached EPA comments are addressed within 14 days of receipt of this letter. The revised texts should be submitted within 14 days of receipt of this letter. If you have any questions, I can be reached at (312) 886-7954.

Sincerely,

A handwritten signature in black ink, appearing to read "Jonathan Adenuga", is written over a faint, circular official stamp.

Jonathan Adenuga  
Corrective Action Section  
Enforcement Compliance Assurance Branch

cc: Bradley Martin, Techlaw Inc.,  
cc: Ruth Jean, IDEM



## **SAMPLING AND ANALYSIS PLAN AND MONITORED NATURAL ATTENUATION WORK PLAN**

**Evaluation of Response to General Comment (GC) 1a:** The response does not address the comment. The response indicates that Appendix D, Sampling and Analysis Plan, of Attachment D, Construction Quality Assurance Plan (hereinafter referred to as SAP) provides the quality assurance project plan (QAPP) components. However, the SAP does not present all information required to be presented in a QAPP. Further, please note that the previous comments provided only examples of deficiencies when comparing the SAP to *EPA Requirements for Quality Assurance Project Plans*, dated March 2001 (EPA QA/R-5), and were not intended to be an all inclusive comparison. A QAPP, which presents all of the information contained in the *EPA Requirements for Quality Assurance Project Plans*, dated March 2001 (EPA QA/R-5) should be prepared and submitted for review. Where applicable, the QAPP may reference the SAP for required information.

Additionally, the response indicates that Attachment A of the SAP contains laboratory standard operating procedures, method detection limits, and quality control acceptance criteria; however, Attachment A of the SAP has not been provided. Revise the SAP to provide Attachment A.

**Evaluation of Response to GC 1b:** The response does not address the comment. The response indicates that data quality objectives (DQOs) were provided in Table 2 of the SAP; however, the DQOs listed in Table 2 do not provide the level of information necessary in a QAPP. Revise the SAP to present detailed DQOs, consistent with EPA's *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA QA/G-4).

**Evaluation of Response to GC 1c:** The response partially addresses the comment. The referenced sections provide the sampling design. However, the rationale for why the sampling design is sufficient to meet study goals is not provided. Revise the SAP to provide a rationale for all sampling which discusses why the proposed sample numbers, types, locations and analyses are sufficient to meet study goals.

**Evaluation of Response to GC 1d:** The response partially addresses the comment. The response indicates that Attachment B of the SAP contains a typical data validation checklist; however, Attachment B of the SAP has not been provided. Revise the SAP to provide data validation checklists for all proposed analyses.

**Evaluation of Response to GC 1e:** The response partially addresses the comment. Although it is noted that the information included in data validation reports (DVRs) has been provided, it is unclear what will be included in the project reports (e.g., field logs, laboratory data packages, DVRs, etc.). Further, the data reduction discussion does not indicate how analytical data will be incorporated into the final report. Revise the SAP to indicate what will be included in the project reports, and to provide a data reduction discussion which indicates how the analytical data will be incorporated into the final report.





**Evaluation of Response to SC 3 & Comment 7:** The response to this comment is partially adequate; however, Sheet 8 does not appear to list the amount of confirmatory samples to be collected after excavation. Additionally, it is unclear how the 10-foot by 10-foot grid will be applied to oddly shaped areas (i.e., ND1 and ND2) and excavation areas greater than the grid area. Revise Sheet 8 to include the number of samples, and clarify how the grid sampling approach will be applied to each excavation area.

**Evaluation of Response to SC 5 and 9:** The response partially addresses the comment. The response indicates that Attachment C of the SAP contains manufacturer instructions for a Niton XRF unit; however, Attachment C of the SAP has not been provided. Revise the SAP to provide Attachment C.

**Evaluation of Response to SC 11:** The response partially addresses the comment. The text and tables indicate that zip lock baggies will be used for soil samples. However, Section 7.3 of the SAP indicates that samples will be placed on ice. Zip lock baggies may not be sufficient since the baggies may end up sitting in water from melted ice. The baggies can allow water infiltration over time which could result in cross contamination. Revise the SAP to ensure the potential for cross contamination is eliminated.

**Evaluation of Response to SC 12:** The response partially addresses the comment. Minimum sample volumes have been added to Table 3. However, the minimum sample size for many most soils is between 5-10 grams. To ensure that the laboratory has sufficient material to both properly subsample the soils, and re-prepare the soils if QC problems are encountered, it is recommended that at least 50 grams be collected. Revise the SAP to ensure that 50 grams will be collected for all analyses.

**Evaluation of Response to SC 14:** The response addresses the comment; however, further clarification is necessary.

- Section 6.6.2 of the SAP indicates that calibration of field instruments for groundwater monitoring activities will be conducted in accordance with the manufacturer instructions, but these instructions have not been provided. Revise the SAP to provide the manufacturer instructions for all field instruments.
- Section 6.6.3 of the SAP indicates that well stabilization will be reached after conductivity, temperature, pH, and turbidity have reached certain criteria, but dissolved oxygen (DO) and oxygen reduction potential (ORP) have not been discussed. Revise the SAP to indicate the stabilization criteria that will be used for DO and ORP.



## Adenuga, Jonathan

---

**From:** Paul Stratman [pstratman@advancedgeoservices.com]  
**Sent:** Tuesday, March 05, 2013 3:10 PM  
**To:** Adenuga, Jonathan  
**Cc:** matt.love@exide.com; Jennifer DiJoseph  
**Subject:** Beech Grove Permitting

Jonathon,

At the request of Matt Love I have prepared the following summary of permitting process/issues for the Refined Metals Site in Beech Grove Indiana.

- The previously approved Corrective Measures Design (CMD) included the filling/disturbance of all of the 0.49 acres of federally regulated wetlands west of the railroad spur and remediation of approximately 1,500 lineal feet of drainage ditch (approx. 0.14 acres) (this includes the ditch along the railroad spur and railroad tracks). In addition, approximately 0.1 acres of State Isolated Wetlands are proposed to be disturbed by remediation and restoration. Total disturbance = 0.73 acres.
- The revised design currently in for your consideration shows the filling/disturbance of 0.09 acres of federally regulated wetlands west of the railroad spur and remediation and restoration of approximately 1,500 lineal feet of drainage ditch (approx. 0.14 acres). In addition, approximately 0.1 acres of State Isolated Wetlands will be disturbed by remediation and restoration. Total disturbance = 0.33 acres.
- We are required to obtain the following permits for wetlands and water quality:
  - **Site Specific Individual Section 401 Water Quality Certification (WQC)** from IDEM (because the cumulative impacted area is >0.10 acres);
  - **Nationwide Permit 38** (from ACOE) for Section 404 discharge of dredged or fill material into Water of the United States; and
  - **IDEM Isolated Wetlands General Permit** for discharge of dredged or fill material into state isolated wetlands.
  - Remediation of the drainage ditches along the railroad tracks does not meet the ACOE exemption for Maintenance of Drainage Ditches under Section 404 of the Clean Water Act. But if we modify the restoration of the drainage ditch to eliminate the rip-rap channel lining and utilize a soft/natural restoration (such as vegetation with periodic check dams) then the work can be included as an element of the NP-38 permit.
- Issuance of the Section 401 and Section 404 permits require that any activities involving the disturbance or filling of wetlands first be subject to avoidance and minimization to the maximum extent practicable. NP-38 and WQC must include a narrative discussion regarding how the design avoids and minimizes wetlands encroachment.
- In addition, the Hickory Trees in the wooded areas are also preferred habitat for the Indiana Bat, an endangered species, that must be avoided and that clearing can only be completed between the months of October 1 and March 31.

The anticipated activities and estimated time frame to proceed with permitting are as follows:

- Finalize CMD modifications based on USEPA comments. Est. 2 weeks.
- Prepare NP-38 and Individual WQC applications coincident with CMD finalization. Submit both applications simultaneously.
- **Site Specific Individual Section 401 Water Quality Certification** approx. 90 days for review.
- **Section 404 Permits - Nationwide Permit 38** – 60 to 90 days (concurrent with 401 review)
- **IDEM Isolated Wetlands General Permit** (specific to state isolated wetlands only) 30 days. Can be completed concurrent with WQC.
- **City of Indy Drainage Permit revision** - Storm water design and management are dictated by the City of Indianapolis so the design modification relative to storm water will require review and re-issuance of the Storm Drainage permit by the City.

Based on the estimated timeframes shown above approximately 3 to 4 months will be required to complete the Section 401 and 404 permitting.

I am currently in contact with the ACOE and USF&W regarding the limitation on clearing and hope we can get approval to clear the Hickory and White Oak trees in the next 3 weeks (before March 31), otherwise we must wait until October or at least have a Bat Specialist observe the site for Indiana Bats.

Please let me know if you have any questions.

Paul

Paul G. Stratman,

Senior Project Consultant

**Advanced GeoServices**

*"Engineering for the Environment. Planning for People."*<sup>TM</sup>

1055 Andrew Drive, Suite A

West Chester, PA 19380-4293

**Direct** 610.840.9122 **Fax** 610.840.9199

**Email** [pgstratman@advancedgeoservices.com](mailto:pgstratman@advancedgeoservices.com)

**Web Site** <http://www.advancedgeoservices.com>

This message contains information that may be confidential or privileged. Unless you are the addressee (or authorized to receive for the addressee), you may not use, copy, or disclose to anyone this message or any information contained in the message. If you have received this message in error, please advise the sender by reply e-mail and delete all copies of this message and its attachments.



## Adenuga, Jonathan

---

**From:** Paul Stratman [pstratman@advancedgeoservices.com]  
**Sent:** Tuesday, March 05, 2013 4:15 PM  
**To:** Michael\_Litwin@FWS.gov  
**Cc:** matt.love@exide.com; Adenuga, Jonathan  
**Subject:** RMC Beech Grove tree clearing questions  
**Attachments:** 14908 Revised Wetland Delineation Report (1).pdf; 20130305171149999.pdf

Mike,

The Refined Metals Corporation (RMC) facility was the location of lead recycling operations from 1968 through 1995. RMC was involved in the reclamation of lead from used automotive and industrial batteries and other lead-bearing materials. The site ceased normal operations on December 31, 1995. During its operational life, the facility handled hazardous materials or hazardous wastes as regulated under the Resource Conservation and Recovery Act (RCRA). In 1998 RMC entered into a Consent Decree with the United States Environmental Protection Agency (USEPA) and the Indiana Department of Environmental Management (IDEM), Civil Action No. IP902077C. The Consent Decree requires the completion of multiple activities associated with closure of the former hazardous waste management units, site investigation, evaluation and selection of corrective measures and performing corrective action activities.

At this time, RMC has received final USEPA and IDEM approval for the proposed Corrective Measures Implementation Plan and is planning to start Corrective Action Activities in May or June 2013.

Wetlands mapping has identified shagbark hickory in portions of the area that will be the location of the proposed containment cell and will require the clearing of approximately 3.3 acres of trees. As mentioned on the phone, we are concerned about the possibility of being held up from starting construction in June if we are prohibited from clearing trees between April 1 and October 31. We are contemplating performing the tree clearing now (before March 31), but would prefer to wait until we are ready to move with the entire project. Your thoughts/input regarding whether or not we would be prohibited from clearing after March 31 is appreciated.

I have attached a copy of the wetlands report and a figure showing the proposed limit of clearing for your reference.

Thank you for your assistance.

Paul

Paul G. Stratman,

Senior Project Consultant  
**Advanced GeoServices**  
*"Engineering for the Environment. Planning for People."™*  
1055 Andrew Drive, Suite A  
West Chester, PA 19380-4293  
**Direct** 610.840.9122 **Fax** 610.840.9199  
**Email** [pgstratman@advancedgeoservices.com](mailto:pgstratman@advancedgeoservices.com)  
**Web Site** <http://www.advancedgeoservices.com>

This message contains information that may be confidential or privileged. Unless you are the addressee (or authorized to receive for the addressee), you may not use, copy, or disclose to anyone this message or any information contained in the message. If you have received this message in error, please advise the sender by reply e-mail and delete all copies of this message and its attachments.



July 5, 2012

2003-1046-18

**VIA FEDERAL EXPRESS**

Mr. Laban Lindley  
U.S. Army Corps of Engineers  
Indianapolis Field Office  
9799 Billings Road  
Indianapolis, IN 46216

RE: Request for a Jurisdictional Determination  
Former Refined Metals Facility  
3700 South Arlington Avenue  
Beech Grove, Indiana  
Corps ID No. LRL-2012-107 lcl


Dear Mr. Lindley:

Attached please find two hard copies and one electronic copy of the revised Wetlands Delineation Report prepared by Keramida Environmental, Inc. (dated July 3, 2012) for the above-referenced facility. This revised Wetlands Delineation Report includes soils information and photographs as requested. We believe this provides the additional information required for completion of the Jurisdictional Determination.

If you have any questions, please contact me at 601-840-9122. We appreciate your efforts to help expedite this process.

Sincerely,

ADVANCED GEOSERVICES CORP.



Paul G. Stratman, P.E., P.G.  
Senior Project Consultant

PGS:vm

Enclosures

cc: Matthew Love, Exide (one hard copy)



401 North College Avenue  
Indianapolis, Indiana 46202  
(317) 685-6600 • Fax (317) 685-6610  
**1-800-508-8034**

keramida@keramida.com • www.keramida.com

July 3, 2012

Mr. Paul Stratman  
Advanced GeoServices  
1055 Andrew Drive  
West Chester, PA 19380

Re: Wetland Delineation Report  
Former Refined Metals Property  
3700 S. Arlington Avenue  
Beech Grove, Marion County, Indiana  
KERAMIDA Project No. 14908

Dear Mr. Stratman,

KERAMIDA Environmental, Inc. (KERAMIDA) is pleased to submit this report of findings for the wetland delineation at the above-referenced Site. The Site, comprising approximately 24 acres of land, is located at the former Refined Metals property, at 3700 S. Arlington Avenue, Beech Grove, Marion County, Indiana. The purpose of the delineation was to establish the boundaries of wetland areas that were identified at the Site in previous investigations. The delineations were conducted in two separate field events and focused on two separate areas of the Site. The delineation events are discussed further below. It should be noted that the wetland in Area 1 was fully delineated in July 2011 and previously reported to and approved by the U.S. Army Corps of Engineers (USACE). The discussion of Area 1 is included in this document for reference purposes and to provide a single complete report for submittal to USACE. The wetlands in Area 2 were delineated in April 2012.

## **METHODOLOGY AND FINDINGS**

### Area 1

KERAMIDA identified a wetland area during a previous wetland determination field survey, documented in a Wetland Determination Report dated June 27, 2011 (June 2011 Wetland Determination). The wetland identified during the wetland determination was in a wooded/grassy boundary area near the northeastern portion of the Site (refer to Figure 1). This location is hereinafter referred to as Area 1.

KERAMIDA conducted a Site visit on July 14, 2011 to collect data points from Area 1 to determine the boundaries of the wetland with respect to the Site. As observed at the time of the field work, the wetland in Area 1 exhibited hydric soil and hydrologic wetland indicators. The sampling area was slightly concave with water marks apparent on nearby vegetation, indicating that water had once stood in the area. However, very little active vegetation growth was observed within the wetland. As discussed in the June 2011 Wetland Determination, a review of aerial photographs and satellite imagery indicated that the area is inundated during part of the

***INCREASING OUR CLIENTS' PROFITABILITY THROUGH SMART CONSULTING™***

ENGINEERS • GEOLOGISTS • SCIENTISTS • SAFETY PROFESSIONALS • INDUSTRIAL HYGIENISTS • TOXICOLOGISTS • MODELING EXPERTS  
INDIANAPOLIS, IN • CINCINNATI, OH • CHARLESTON, SC • SACRAMENTO, CA • ATHENS, GREECE • ABU DHABI, U.A.E.

year. This evidence suggested that hydrophytic vegetation would most likely grow in the area given the proper conditions and, therefore, the area is a wetland. Delineation of this wetland, given the absence of significant vegetation growth, was based primarily on the presence of hydric soil and hydrologic indicators

Sampling points were selected from the grassy lawn south of the wetland, from within the wetland itself, and from the wooded area bordering the northern portion of the wetland (refer to Figure 2a for sampling point locations). Each sampling point was analyzed for the presence of hydric soils, wetland hydrology and hydrophytic vegetation. The observations at each sampling point were recorded on Field Data Forms, which are enclosed herein.

Based on the visual characteristics of the wetland, and verified through the data collected from the sampling points, stakes and survey flags were placed around the boundaries of the wet prairie-type wetland (see Figure 3a). Measurements based off of the staked boundaries yielded a calculated area for the wetland of approximately 0.2 acre.

#### Area 2

During the USACE Jurisdictional Determination (JD) process, additional suspect wetlands were identified. The suspect wetlands were situated in a wooded area on the northern portion of the Site (refer to Figure 1). This location is hereinafter referred to as Area 2.

KERAMIDA conducted Site visits on April 23, 26, and 27, 2012 to collect data points from within Area 2 to determine the boundaries of the wetlands with respect to the Site. As observed at the time of the field work, Area 2 is a heavily wooded area characterized by varied topography, containing hummocks and small hills, as well as low-lying, partially inundated areas. A historic rail siding runs through Area 2, with ditches present on either side of the former rail siding. The wetlands identified during the USACE JD process are generally located adjacent to the ditches.

The low-lying, partially inundated portions of Area 2, generally located adjacent to the rail siding ditches, exhibited hydrophytic vegetation, hydric soil, and hydrologic wetland indicators, meaning that they would be classified as wetlands. The purpose of KERAMIDA's field activities was to delineate these wetlands within Area 2. Due to the generally homogeneous soil conditions and prevalence of several wetland indicator plants throughout Area 2, delineation of these wetlands was based primarily on the presence of hydrologic indicators and variations in surface topography.

Sampling points were selected from within Area 2 (refer to Figure 2b for sampling point locations). Each sampling point was analyzed for the presence of hydric soils, wetland hydrology and hydrophytic vegetation. The observations at each sampling point were recorded on Field Data Forms, which are enclosed herein.

Based on the visual characteristics of the wetlands observed in Area 2, and verified through the data collected from the sampling points, stakes and survey flags were placed around the boundaries of three floodplain forest-type wetlands (see Figure 3b). Measurements based off of the staked boundaries yielded a total calculated area for the three wetlands of approximately 0.51

acre. The individual wetland areas (two on the west side of the rail siding, and one located near the northeast corner of the Site) are estimated at: 0.33 acre, 0.16 acre, and 0.11 acre, respectively.

Representative photographs of the respective wetland areas are attached to this document. Also included is a USDA soils map of the overall property (Figure 5).

## CONCLUSIONS

### Area 1

The closest Water of the U.S. relative to Area 1 is Sloan Ditch, located approximately 1,100 feet southeast. No connection to this or any other Water of the U.S. was found during the delineation or map review. Refer to Figure 4 (topographic map) for the location of Sloan Ditch relative to Area 1. Delineation of the wetland indicated the area is approximately 0.2 acre in size, with no identified connection to a Water of the U.S. Because the wetland does not abut or adjoin a Water of the U.S., it would be considered an isolated wetland, likely classified as a Class I or Class II wetland, as defined in Indiana Code 13-11-2-25.8.

### Area 2

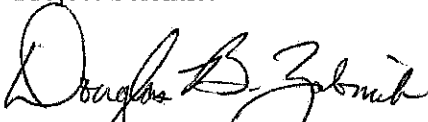
The wetlands in Area 2 are located generally adjacent to the ditches that run alongside a former rail spur on the property. The ditches are connected to the non-navigable Water of the U.S. Beech Creek, which is a tributary of Lick Creek. Because of the connection to a Water of the U.S., the ditches, and therefore the adjacent wetland areas, fall under the jurisdiction of USACE. It is anticipated that USACE permitting requirements will apply if the wetlands are to be disturbed.

If you have any questions concerning this information, please contact Colin Keith at (317) 685-6617. Thank you for the opportunity to assist you with this project.

Sincerely,  
KERAMIDA Environmental, Inc.



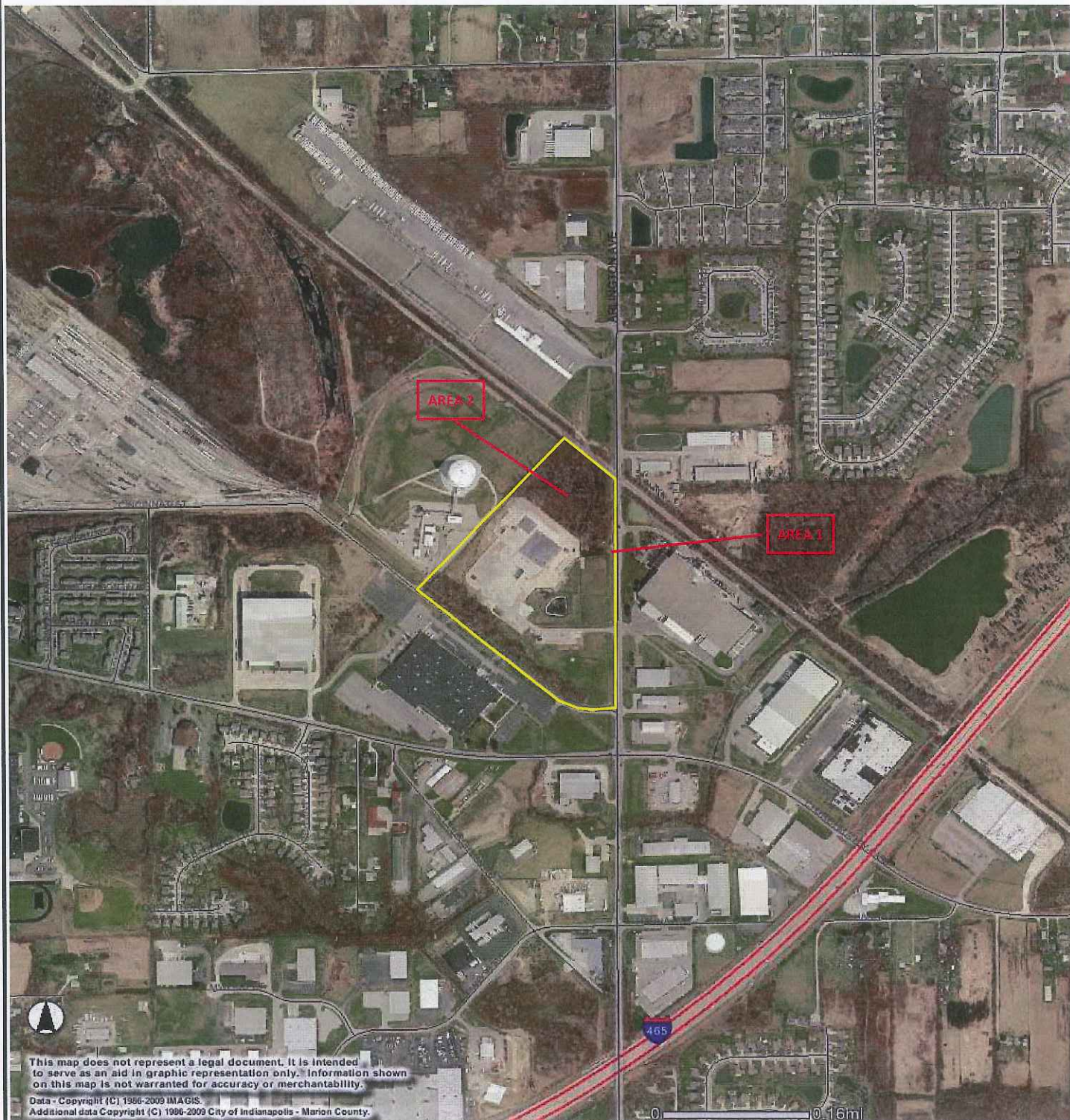
Colin Keith  
Project Scientist



Douglas B. Zabonick, P.E.  
President

Enclosures





#### Legend

Approximate Site Boundary: —

Image Source: IMAGIS, 2010 Aerial



**Figure 1**  
**Site Map**  
**Former Refined Metals Property**  
**3700 South Arlington Avenue**  
**Beech Grove, Indiana**

Prepared by: CK  
Approved by: CH  
Date: 5/22/12  
Scale: as noted  
KEI Number: 14908







#### Legend

Wetland Data Point: ⊗

Image Source: IMAGIS, 2010 Aerial

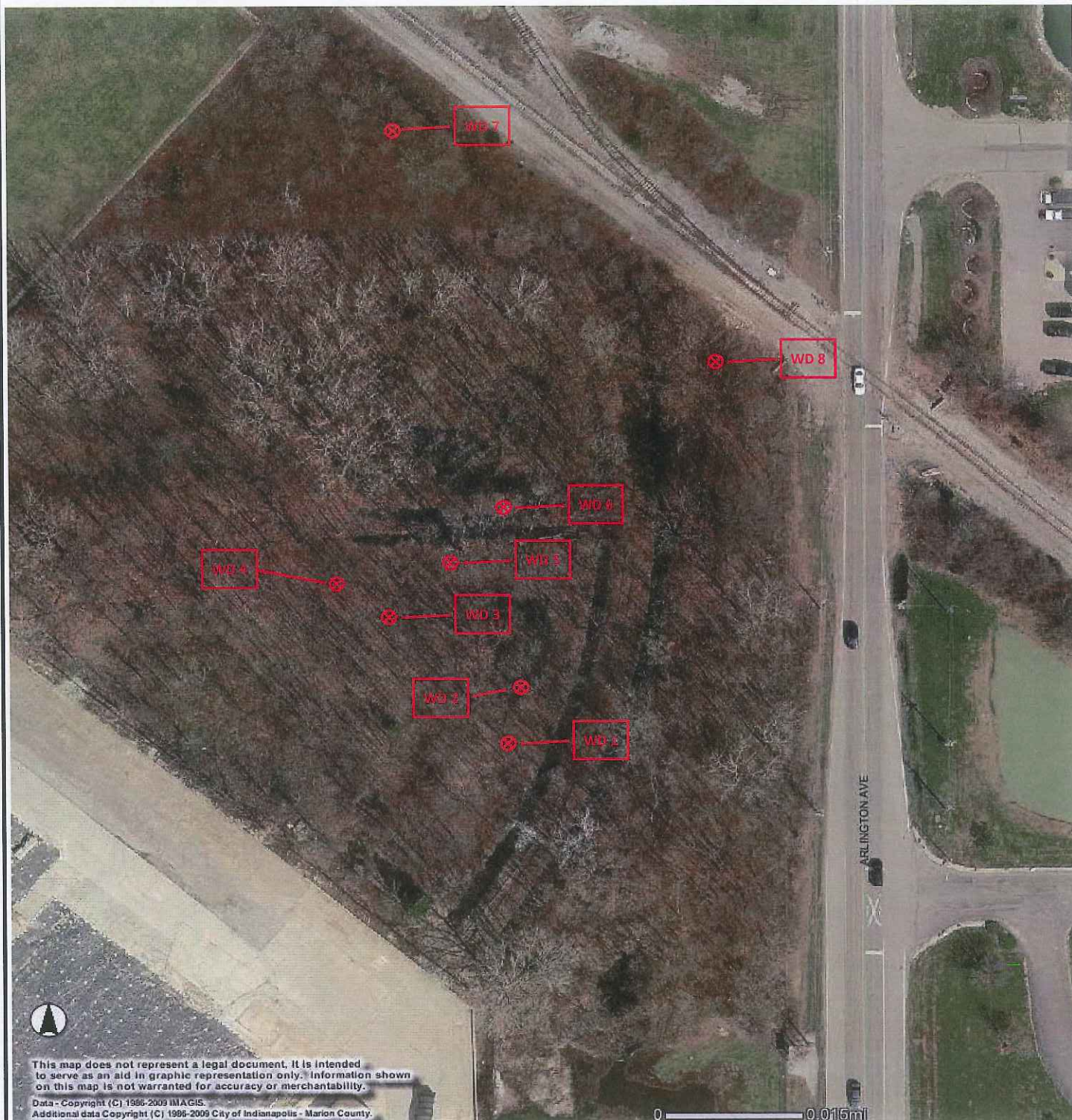


**Figure 2a**  
**Sampling Point Location Map - Area 1**  
**Former Refined Metals Property**  
**3700 South Arlington Avenue**  
**Beech Grove, Indiana**

Prepared by: CK  
 Approved by: CH  
 Date: 5/22/12  
 Scale: as noted  
 KEI Number: 14908







#### Legend

Wetland Data Point:

Image Source: IMAGIS, 2010 Aerial

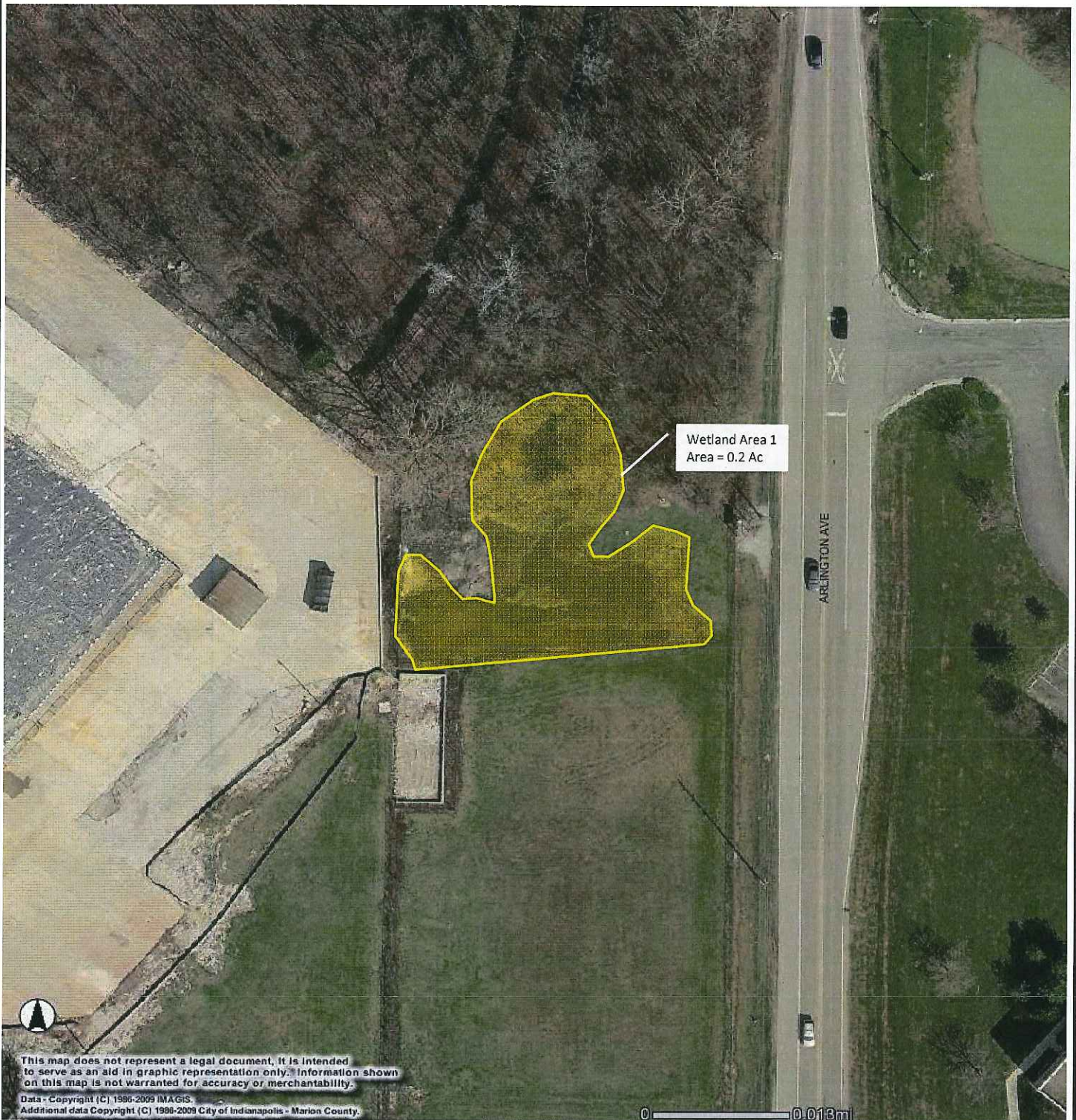


**Figure 2b**  
Sampling Point Location Map - Area 2  
Former Refined Metals Property  
3700 South Arlington Avenue  
Beech Grove, Indiana

Prepared by: CK  
Approved by: CH  
Date: 5/22/12  
Scale: as noted  
KEI Number: 14908







**Legend**

Approximate Wetland Boundary: ———

Image Source: IMAGIS, 2010 Aerial

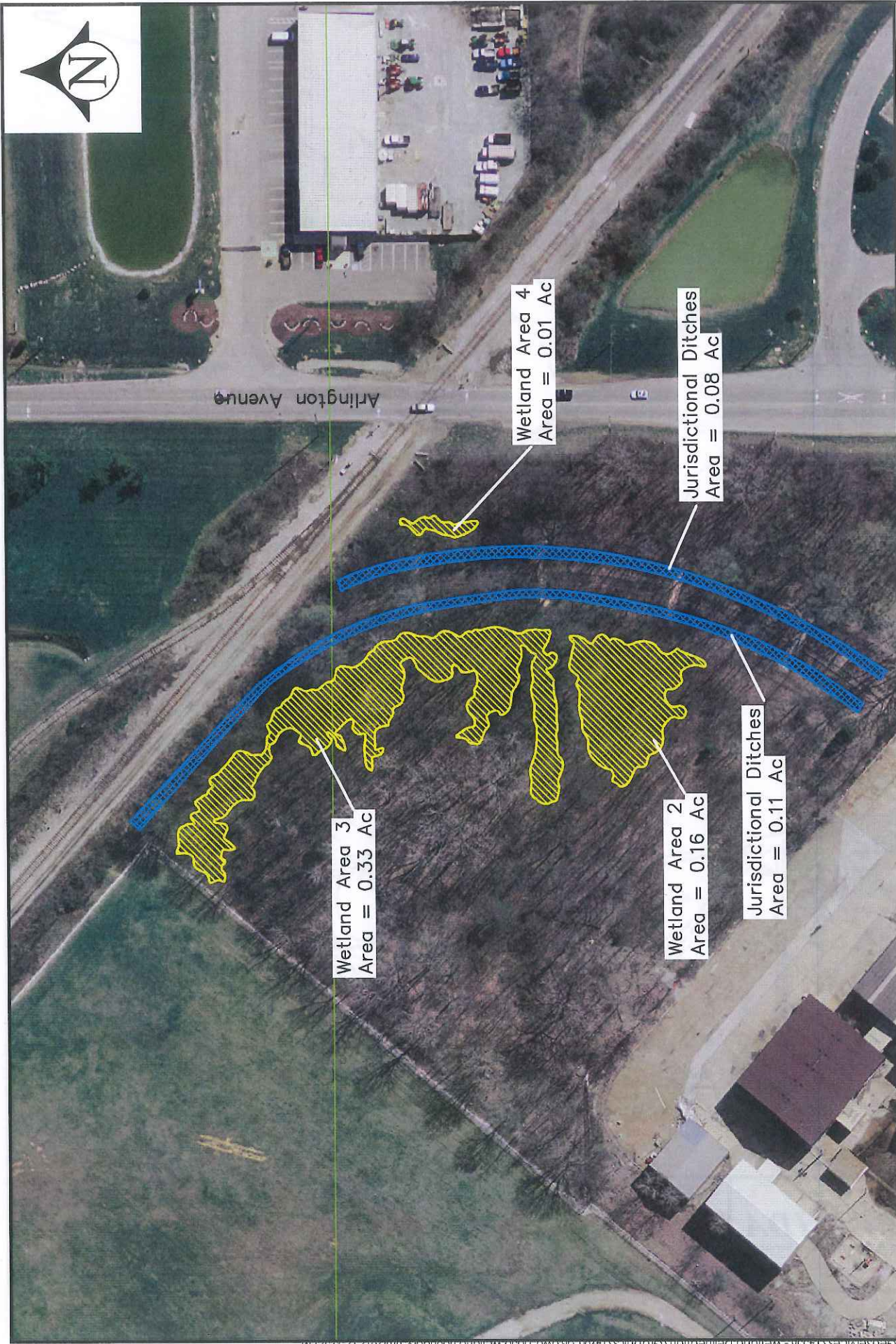


**Figure 3a**  
**Wetland Boundary Map - Area 1**  
**Former Refined Metals Property**  
**3700 South Arlington Avenue**  
**Beech Grove, Indiana**

Prepared by: **CK**  
 Approved by: **CH**  
 Date: **5/22/12**  
 Scale: **as noted**  
 KEI Number: **14908**







**Project:** Former Refined Metals  
3700 South Arlington Avenue  
Beech Grove, Indiana

Project Number:	14908	Drawn By:	J. DuMond
Date:	May 22, 2012	Approved By:	CK
		File No.	14908_gis

**Figure 3b**

**Wetland Boundary Map**

**Area 2**

**KERAMIDA**  
Global EHS & Sustainability Services

**SCALE:**

0 50' 100'



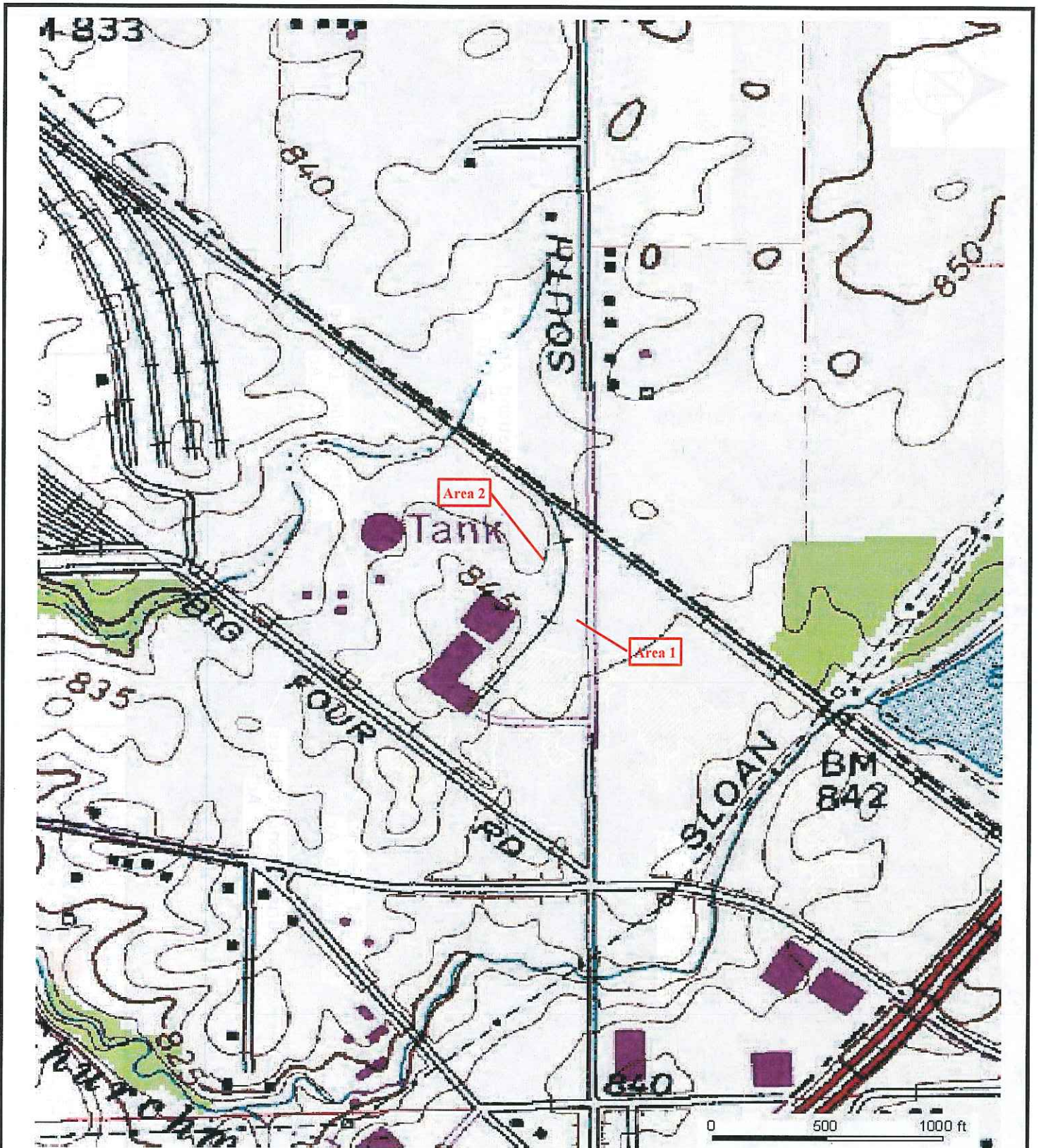


Image Source: Indiana Map



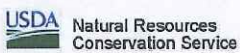
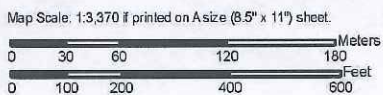


Soil Map—Marion County, Indiana  
(The Refined Metals Corp - Soils)



**Soil Legend**

- Br Brooklyn silty clay loam
- CrA Crosby silt loam, 0 to 2% slopes
- Mmb2 Miami Silt Loam, 2 to 6% slopes, eroded
- Ub Urban land-Brookston complex
- Uc Urban land-Crosby complex
- Umb Urban land-Miami complex, 0 to 6% slopes



Web Soil Survey  
National Cooperative Soil Survey

6/13/2011  
Page 1 of 3



Project: Former Refined Metals  
3700 South Arlington Avenue  
Beech Grove, Indiana

Project Number: 14908	Drawn By: J. DuMond
Date: June 27, 2012	Approved By: 14908
	File No. 14908_soil

Figure 5

Soil Map



Photo Date:	Project:	Project #
July 2, 2012	Former Refined Metals Property	14908

Photo #1

Wetland in Area 1.



Photo #2

Wetland 1 in Area 2.





Photo Date:	Project:	Project #
July 2, 2012	Former Refined Metals Property	14908

Photo #3

Wetland 2 in Area 2.



Photo #4

Wetland 3 in Area 2.



# **WETLAND DETERMINATION DATA FORM - Midwest Region**

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-1  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): Slight Concave  
 Slope (%): 0 Lat: 39.71655 Long: 86.064325 Datum: WGS84  
 Soil Map Unit Name Brookston silty clay loam NWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation       , soil       , or hydrology        significantly disturbed? Are "normal circumstances"       

Are vegetation       , soil       , or hydrology        naturally problematic? present? Yes

## **SUMMARY OF FINDINGS**

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: <u>      </u>
Hydric soil present? <u>Y</u>	
Wetland hydrology present? <u>N</u>	

Remarks: (Explain alternative procedures here or in a separate report.)

## **VEGETATION -- Use scientific names of plants.**

Tree Stratum (Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Dominance Test Worksheet</b> Number of Dominant Species that are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across all Strata: <u>3</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
1 <u>Fraxinus pennsylvanica</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
2 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>20</u> = Total Cover				<b>Prevalence Index Worksheet</b> Total % Cover of: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>40</u> x 2 = <u>80</u> FAC species <u>10</u> x 3 = <u>30</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>50</u> (A) <u>110</u> (B) Prevalence Index = B/A = <u>2.20</u>
<b>Sapling/Shrub stratum</b> (Plot size: <u>      </u> )				
1 <u>Acer negundo</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
2 <u>Lonicera morrowii</u>	<u>      </u>	<u>      </u>	<u>NI</u>	
3 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>20</u> = Total Cover				
<b>Herb stratum</b> (Plot size: <u>      </u> )				<b>Hydrophytic Vegetation Indicators:</b> Rapid test for hydrophytic vegetation <input checked="" type="checkbox"/> Dominance test is >50% <input checked="" type="checkbox"/> Prevalence index is ≤3.0* Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) Problematic hydrophytic vegetation* (explain) <u>      </u> *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1 <u>Lonicera morrowii</u>	<u>      </u>	<u>      </u>	<u>NI</u>	
2 <u>Parthenocissus quinquefolia</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	
3 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
6 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
7 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
8 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
9 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>10</u> = Total Cover				
<b>Woody vine stratum</b> (Plot size: <u>      </u> )				<b>Hydrophytic vegetation present?</b> <u>Y</u>
1 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
2 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>0</u> = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet)



## SOIL

Sampling Point: WD-1**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 3/2	80	10 YR 5/6	20	RM	M	SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

**Hydric Soil Indicators:**

- ☐ Histisol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☐ 2 cm Muck (A10)  
☒ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ 5 cm Mucky Peat or Peat (S3)

- ☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Loamy Mucky Mineral (F1)  
☐ Loamy Gleyed Matrix (F2)  
☐ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils:**

- ☐ Coast Prairie Redox (A16) (LRR K, L, R)  
☐ Dark Surface (S7) (LRR K, L)  
☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  
☐ Iron-Manganese Masses (F12) (LRR K, L, R)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (explain in remarks)

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

**Restrictive Layer (if observed):**
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_
Hydric soil present? Y

Remarks:

**HYDROLOGY****Wetland Hydrology Indicators:**Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)  
☐ High Water Table (A2)  
☐ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Water-Stained Leaves (B9)

- ☐ Aquatic Fauna (B13)  
☐ True Aquatic Plants (B14)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Oxidized Rhizospheres on Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Recent Iron Reduction in Tilled Soils (C6)  
☐ Thin Muck Surface (C7)  
☐ Gauge or Well Data (D9)  
☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface water present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 Water table present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 Saturation present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

**Wetland hydrology present?** N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-2  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): Slight Concave  
 Slope (%): 0 Lat: 39.716633 Long: 86.064308 Datum: WGS84  
 Soil Map Unit Name Brookston silty clay loam VWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)  
 Are vegetation       , soil       , or hydrology        significantly disturbed? Are "normal circumstances" present? Yes  
 Are vegetation       , soil       , or hydrology        naturally problematic? (If needed, explain any answers in remarks.)

## SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u> If yes, optional wetland site ID: <u>Wetland Area 2</u>
Hydric soil present? <u>Y</u>	
Wetland hydrology present? <u>Y</u>	

Remarks: (Explain alternative procedures here or in a separate report.)

## VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Dominance Test Worksheet</b> Number of Dominant Species that are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across all Strata: <u>3</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
1 <u>Fraxinus pennsylvanica</u>	80	Y	FACW	
2 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
80 = Total Cover				
<b>Sapling/Shrub stratum</b> (Plot size: <u>      </u> )				
1 <u>Acer negundo</u>	20	Y	FACW	<b>Prevalence Index Worksheet</b> Total % Cover of: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>180</u> x 2 = <u>360</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>180</u> (A) <u>360</u> (B) Prevalence Index = B/A = <u>2.00</u>
2 <u>Lonicera morrowii</u>	<u>      </u>	<u>      </u>	NI	
3 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
6 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
20 = Total Cover				
<b>Herb stratum</b> (Plot size: <u>      </u> )				
1 <u>Lonicera morrowii</u>	<u>      </u>	<u>      </u>	NI	<b>Hydrophytic Vegetation Indicators:</b> Rapid test for hydrophytic vegetation <input checked="" type="checkbox"/> Dominance test is >50% <input checked="" type="checkbox"/> Prevalence index is ≤3.0* Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) Problematic hydrophytic vegetation* (explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
2 <u>Fraxinus pennsylvanica</u>	80	Y	FACW	
3 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
6 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
7 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
8 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
9 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
10 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
80 = Total Cover				
<b>Woody vine stratum</b> (Plot size: <u>      </u> )				
1 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	<b>Hydrophytic vegetation present?</b> <u>Y</u>
2 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
0 = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet)

## SOIL

Sampling Point: WD-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 4/1	90	7.5 YR 5/6	10	RM	M	SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

## Hydric Soil Indicators:

- ☐ Histisol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☐ 2 cm Muck (A10)  
☒ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ 5 cm Mucky Peat or Peat (S3)

- ☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Loamy Mucky Mineral (F1)  
☐ Loamy Gleyed Matrix (F2)  
☐ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

## Indicators for Problematic Hydric Soils:

- ☐ Coast Prairie Redox (A16) (LRR K, L, R)  
☐ Dark Surface (S7) (LRR K, L)  
☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  
☐ Iron-Manganese Masses (F12) (LRR K, L, R)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (explain in remarks)

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

## Restrictive Layer (if observed):

 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_
Hydric soil present? Y

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)  
☒ High Water Table (A2)  
☒ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☒ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☒ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☒ Water-Stained Leaves (B9)

- ☐ Aquatic Fauna (B13)  
☐ True Aquatic Plants (B14)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Oxidized Rhizospheres on Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Recent Iron Reduction in Tilled Soils (C6)  
☐ Thin Muck Surface (C7)  
☐ Gauge or Well Data (D9)  
☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface water present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_  
 Water table present? Yes ☒ No ☐ Depth (inches): 12  
 Saturation present? Yes ☒ No ☐ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# **WETLAND DETERMINATION DATA FORM - Midwest Region**

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-3  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): Slight Concave  
 Slope (%): 0 Lat: 39.71675 Long: 86.064581 Datum: WGS84  
 Soil Map Unit Name Brookston silty clay loam VWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation \_\_\_\_\_, soil \_\_\_\_\_, or hydrology \_\_\_\_\_ significantly disturbed? Are "normal circumstances" \_\_\_\_\_

Are vegetation \_\_\_\_\_, soil \_\_\_\_\_, or hydrology \_\_\_\_\_ naturally problematic? present? Yes

## **SUMMARY OF FINDINGS**

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u> If yes, optional wetland site ID: <u>Wetland Area 2</u>
Hydric soil present? <u>Y</u>	
Wetland hydrology present? <u>Y</u>	

Remarks: (Explain alternative procedures here or in a separate report.)

## **VEGETATION -- Use scientific names of plants.**

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	<b>Dominance Test Worksheet</b> Number of Dominant Species that are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across all Strata: <u>5</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
1 <i>Fraxinus pennsylvanica</i>	60	Y	FACW	
2 _____	_____	_____	_____	
3 _____	_____	_____	_____	
4 _____	_____	_____	_____	
5 _____	_____	_____	_____	
60 = Total Cover				<b>Prevalence Index Worksheet</b> Total % Cover of: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>75</u> x 2 = <u>150</u> FAC species <u>95</u> x 3 = <u>285</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>170</u> (A) <u>435</u> (B) Prevalence Index = B/A = <u>2.56</u>
<b>Sapling/Shrub stratum</b> (Plot size: _____)				
1 <i>Acer negundo</i>	10	Y	FACW	
2 <i>Lonicera morrowii</i>	_____	_____	NI	
3 <i>Fraxinus pennsylvanica</i>	5	Y	FACW	
4 _____	_____	_____	_____	
15 = Total Cover				
<b>Herb stratum</b> (Plot size: _____)				<b>Hydrophytic Vegetation Indicators:</b> Rapid test for hydrophytic vegetation <input checked="" type="checkbox"/> Dominance test is >50% <input checked="" type="checkbox"/> Prevalence index is ≤3.0* Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) Problematic hydrophytic vegetation* (explain) _____ *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1 <i>Zizia aurea</i>	95	Y	FAC	
2 _____	_____	_____	_____	
3 _____	_____	_____	_____	
4 _____	_____	_____	_____	
5 _____	_____	_____	_____	
95 = Total Cover				
<b>Woody vine stratum</b> (Plot size: _____)				<b>Hydrophytic vegetation present?</b> <u>Y</u>
1 <i>Toxicodendron radicans subsp. negundo</i>	5	Y	FAC	
2 _____	_____	_____	_____	
5 = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet)



## SOIL

Sampling Point: WD-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 3/2	90	7.5 YR 5/6	10	RM	M	SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

## Hydric Soil Indicators:

- |   |   |
|---|---|
| <input type="checkbox"/> Histisol (A1)                                | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)                         | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                            | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                        | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)                       | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                              | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)                     | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                     | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)                 |   |

## Indicators for Problematic Hydric Soils:

- |   |
|---|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)    |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L)               |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)  |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12)           |
| <input type="checkbox"/> Other (explain in remarks)                 |

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

## Restrictive Layer (if observed):

 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_
Hydric soil present? Y

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |  |   |
|--|---|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input checked="" type="checkbox"/> High Water Table (A2)          | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input checked="" type="checkbox"/> Drift Deposits (B3)            | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks)                 |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   |
| <input checked="" type="checkbox"/> Water-Stained Leaves (B9)      |   |

Secondary Indicators (minimum of two required)

- |  |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Geomorphic Position (D2)                  |
| <input type="checkbox"/> FAC-Neutral Test (D5)                     |

## Field Observations:

Surface water present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____
Water table present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>12</u>
Saturation present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): _____

 (includes capillary fringe)
Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-4  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): None  
 Slope (%): 0 Lat: 39.716839 Long: 86.064706 Datum: WGS84  
 Soil Map Unit Name Brookston silty clay loam VWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)  
 Are vegetation       , soil       , or hydrology        significantly disturbed? Are "normal circumstances" present? Yes  
 Are vegetation       , soil       , or hydrology        naturally problematic? present? Yes

## SUMMARY OF FINDINGS (If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	<u>Y</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: <u>      </u>
Hydric soil present?	<u>N</u>	
Wetland hydrology present?	<u>N</u>	

Remarks: (Explain alternative procedures here or in a separate report.)

## VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status
1	<i>Carya ovata</i>	70	Y	FACU
2	<i>Fraxinus pennsylvanica</i>	20	Y	FACW
3				
4				
5				
		90	= Total Cover	

Sapling/Shrub stratum	(Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status
1	<i>Lonicera morrowii</i>			NI
2				
3				
4				
5				
		0	= Total Cover	

Herb stratum	(Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status
1	<i>Lonicera morrowii</i>			NI
2	<i>Parthenocissus quinquefolia</i>	70	Y	FAC
3	<i>Toxicodendron radicans subsp. negundo</i>	10	N	FAC
4				
5				
6				
7				
8				
9				
10				
		80	= Total Cover	

Woody vine stratum	(Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
		0	= Total Cover	

### Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 66.67% (A/B)

### Prevalence Index Worksheet

Total % Cover of:

OBL species	<u>0</u>	x 1 =	<u>0</u>
FACW species	<u>20</u>	x 2 =	<u>40</u>
FAC species	<u>80</u>	x 3 =	<u>240</u>
FACU species	<u>70</u>	x 4 =	<u>280</u>
UPL species	<u>0</u>	x 5 =	<u>0</u>
Column totals	<u>170</u> (A)		<u>560</u> (B)

Prevalence Index = B/A = 3.29

### Hydrophytic Vegetation Indicators:

Rapid test for hydrophytic vegetation

☒ Dominance test is >50%

☐ Prevalence index is ≤3.0\*

Morphological adaptations\* (provide supporting data in Remarks or on a separate sheet)

Problematic hydrophytic vegetation\* (explain)

\*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

### Hydrophytic vegetation present?

Y

Remarks: (Include photo numbers here or on a separate sheet)

## SOIL

Sampling Point: WD-4**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 3/3	100					SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

**Hydric Soil Indicators:**

- |  |   |
|--|---|
| <input type="checkbox"/> Histisol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |   |

**Indicators for Problematic Hydric Soils:**

- |   |
|---|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)    |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L)               |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)  |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12)           |
| <input type="checkbox"/> Other (explain in remarks)                 |

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

**Restrictive Layer (if observed):**
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_
Hydric soil present? N

Remarks:

**HYDROLOGY****Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- |  |   |
|--|---|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks)                 |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   |
| <input type="checkbox"/> Water-Stained Leaves (B9)                 |   |

Secondary Indicators (minimum of two required)

- |  |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Geomorphic Position (D2)                  |
| <input type="checkbox"/> FAC-Neutral Test (D5)                     |

**Field Observations:**

Surface water present?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Depth (inches): _____
Water table present?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Depth (inches): _____
Saturation present?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Depth (inches): _____

 (includes capillary fringe)

 Wetland  
hydrology  
present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-5  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): Slight Convex  
 Slope (%): 0 Lat: 39.716872 Long: 86.064478 Datum: WGS84  
 Soil Map Unit Name Brookston silty clay loam VWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation           , soil           , or hydrology            significantly disturbed? Are "normal circumstances"           

Are vegetation           , soil           , or hydrology            naturally problematic? present? Yes

## SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	<u>Y</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: <u>          </u>
Hydric soil present?	<u>N</u>	
Wetland hydrology present?	<u>N</u>	
Remarks: (Explain alternative procedures here or in a separate report.)		

## VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>          </u> )	Absolute % Cover	Dominant Species	Indicator Status
1 <u>Carya ovata</u>		50	Y	FACU
2 <u>          </u>				
3 <u>          </u>				
4 <u>          </u>				
5 <u>          </u>				
		50	= Total Cover	
Sapling/Shrub stratum	(Plot size: <u>          </u> )			
1 <u>Lonicera morrowii</u>				NI
2 <u>          </u>				
3 <u>          </u>				
4 <u>          </u>				
5 <u>          </u>				
		0	= Total Cover	
Herb stratum	(Plot size: <u>          </u> )			
1 <u>Lonicera morrowii</u>				NI
2 <u>Parthenocissus quinquefolia</u>		10	Y	FAC
3 <u>Toxicodendron radicans subsp. negundo</u>		10	Y	FAC
4 <u>          </u>				
5 <u>          </u>				
6 <u>          </u>				
7 <u>          </u>				
8 <u>          </u>				
9 <u>          </u>				
10 <u>          </u>				
		20	= Total Cover	
Woody vine stratum	(Plot size: <u>          </u> )			
1 <u>          </u>				
2 <u>          </u>				
		0	= Total Cover	

### Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 66.67% (A/B)

### Prevalence Index Worksheet

Total % Cover of:

OBL species	<u>0</u>	x 1 =	<u>0</u>
FACW species	<u>0</u>	x 2 =	<u>0</u>
FAC species	<u>20</u>	x 3 =	<u>60</u>
FACU species	<u>50</u>	x 4 =	<u>200</u>
UPL species	<u>0</u>	x 5 =	<u>0</u>
Column totals	<u>70</u> (A)		<u>260</u> (B)

Prevalence Index = B/A = 3.71

### Hydrophytic Vegetation Indicators:

Rapid test for hydrophytic vegetation

X Dominance test is >50%

           Prevalence index is ≤3.0\*

Morphological adaptations\* (provide supporting data in Remarks or on a separate sheet)

           Problematic hydrophytic vegetation\* (explain)

\*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

### Hydrophytic vegetation present?

Y

Remarks: (Include photo numbers here or on a separate sheet)



## SOIL

Sampling Point: WD-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 3/3	100					SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

## Hydric Soil Indicators:

- |  |   |
|--|---|
| <input type="checkbox"/> Histisol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |   |

## Indicators for Problematic Hydric Soils:

- |   |
|---|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)    |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L)               |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)  |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12)           |
| <input type="checkbox"/> Other (explain in remarks)                 |

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

## Restrictive Layer (if observed):

 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_
Hydric soil present? N

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |  |   |
|--|---|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks)                 |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   |
| <input type="checkbox"/> Water-Stained Leaves (B9)                 |   |

Secondary Indicators (minimum of two required)

- |  |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Geomorphic Position (D2)                  |
| <input type="checkbox"/> FAC-Neutral Test (D5)                     |

## Field Observations:

Surface water present?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Depth (inches):	_____
Water table present?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Depth (inches):	_____
Saturation present?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Depth (inches):	_____

 (includes capillary fringe)
Wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# **WETLAND DETERMINATION DATA FORM - Midwest Region**

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-6  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): Convex  
 Slope (%): 0 Lat: 39.71675 Long: 86.064581 Datum: WGS84  
 Soil Map Unit Name Urban Land-Brookston Complex NWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)  
 Are vegetation           , soil           , or hydrology            significantly disturbed? Are "normal circumstances" present? Yes  
 Are vegetation           , soil           , or hydrology            naturally problematic?           

## **SUMMARY OF FINDINGS** (If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: <u>                    </u>
Hydric soil present? <u>N</u>	
Wetland hydrology present? <u>N</u>	

Remarks: (Explain alternative procedures here or in a separate report.)

## **VEGETATION -- Use scientific names of plants.**

Tree Stratum	(Plot size: <u>          </u> )	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
		<u>0</u> = Total Cover		
Sapling/Shrub stratum	(Plot size: <u>          </u> )			
1	<u>Acer negundo</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>
2	<u>Lonicera morrowii</u>			<u>NI</u>
3				
4				
5				
		<u>20</u> = Total Cover		
Herb stratum	(Plot size: <u>          </u> )			
1	<u>Hydrophyllum virginianum</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>
2	<u>Zizia aurea</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>
3	<u>Lonicera morrowii</u>			<u>NI</u>
4				
5				
6				
7				
8				
9				
10				
		<u>30</u> = Total Cover		
Woody vine stratum	(Plot size: <u>          </u> )			
1		<u>5</u>	<u>Y</u>	
2				
		<u>5</u> = Total Cover		

**Dominance Test Worksheet**

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 4 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 75.00% (A/B)

**Prevalence Index Worksheet**

Total % Cover of:

OBL species	<u>0</u> x 1 =	<u>0</u>
FACW species	<u>40</u> x 2 =	<u>80</u>
FAC species	<u>10</u> x 3 =	<u>30</u>
FACU species	<u>0</u> x 4 =	<u>0</u>
UPL species	<u>0</u> x 5 =	<u>0</u>
Column totals	<u>50</u> (A)	<u>110</u> (B)

Prevalence Index = B/A = 2.20

**Hydrophytic Vegetation Indicators:**

       Rapid test for hydrophytic vegetation

X Dominance test is >50%

X Prevalence index is ≤3.0\*

       Morphological adaptations\* (provide supporting data in Remarks or on a separate sheet)

       Problematic hydrophytic vegetation\* (explain)

\*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic vegetation present?** Y

Remarks: (Include photo numbers here or on a separate sheet)

## SOIL

Sampling Point: WD-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 4/6	100					SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

**Hydric Soil Indicators:**

- |  |   |
|--|---|
| <input type="checkbox"/> Histisol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |   |

**Indicators for Problematic Hydric Soils:**

- |   |
|---|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)    |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L)               |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)  |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12)           |
| <input type="checkbox"/> Other (explain in remarks)                 |

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

**Restrictive Layer (if observed):**
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_
Hydric soil present? N

Remarks:

**HYDROLOGY****Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- |  |
|--|
| <input type="checkbox"/> Surface Water (A1)                        |
| <input type="checkbox"/> High Water Table (A2)                     |
| <input type="checkbox"/> Saturation (A3)                           |
| <input type="checkbox"/> Water Marks (B1)                          |
| <input type="checkbox"/> Sediment Deposits (B2)                    |
| <input type="checkbox"/> Drift Deposits (B3)                       |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   |
| <input type="checkbox"/> Iron Deposits (B5)                        |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |
| <input type="checkbox"/> Water-Stained Leaves (B9)                 |

- |   |
|---|
| <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- |  |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Geomorphic Position (D2)                  |
| <input type="checkbox"/> FAC-Neutral Test (D5)                     |

**Field Observations:**

Surface water present?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Depth (inches): _____
Water table present?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Depth (inches): _____
Saturation present?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Depth (inches): _____

 (includes capillary fringe)
Wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-7  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): None  
 Slope (%): 0 Lat: 39.717581 Long: 86.064564 Datum: WGS84  
 Soil Map Unit Name Urban Land-Crosby Complex NWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation           , soil           , or hydrology            significantly disturbed? Are "normal circumstances"

Are vegetation           , soil           , or hydrology            naturally problematic? present? Yes

## SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u> If yes, optional wetland site ID: <u>Wetland Area 3</u>
Hydric soil present? <u>Y</u>	
Wetland hydrology present? <u>Y</u>	

Remarks: (Explain alternative procedures here or in a separate report.)

## VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>          </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Dominance Test Worksheet</b> Number of Dominant Species that are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across all Strata: <u>3</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
1 <u>Fraxinus pennsylvanica</u>	30	Y	FACW	
2 <u>                                  </u>				
3 <u>                                  </u>				
4 <u>                                  </u>				
5 <u>                                  </u>				
30 = Total Cover				
Sapling/Shrub stratum (Plot size: <u>          </u> )				<b>Prevalence Index Worksheet</b> Total % Cover of: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>60</u> x 2 = <u>120</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>60</u> (A) <u>120</u> (B) Prevalence Index = B/A = <u>2.00</u>
1 <u>                                  </u>				
2 <u>Acer negundo</u>	25	Y	FACW	
3 <u>Lonicera morrowii</u>			NI	
4 <u>                                  </u>				
5 <u>                                  </u>				
25 = Total Cover				
Herb stratum (Plot size: <u>          </u> )				<b>Hydrophytic Vegetation Indicators:</b> Rapid test for hydrophytic vegetation <input checked="" type="checkbox"/> Dominance test is >50% <input checked="" type="checkbox"/> Prevalence index is ≤3.0* Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) Problematic hydrophytic vegetation* (explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1 <u>Fraxinus pennsylvanica</u>	5	Y	FACW	
2 <u>                                  </u>				
3 <u>                                  </u>				
4 <u>                                  </u>				
5 <u>                                  </u>				
6 <u>                                  </u>				
7 <u>                                  </u>				
8 <u>                                  </u>				
9 <u>                                  </u>				
10 <u>                                  </u>				
5 = Total Cover				
Woody vine stratum (Plot size: <u>          </u> )				<b>Hydrophytic vegetation present?</b> <u>Y</u>
1 <u>                                  </u>				
2 <u>                                  </u>				
0 = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet)



**SOIL**

 Sampling Point: WD-7
**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 3/2	95	10 YR 5/6	5	RM	M	SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.      \*\*Location: PL = Pore Lining, M = Matrix

**Hydric Soil Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Histisol (A1)                                | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)                         | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                            | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                        | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)                       | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                              | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)                     | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                     | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)                 |   |

**Indicators for Problematic Hydric Soils:**

- |   |
|---|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)    |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L)               |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)  |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12)           |
| <input type="checkbox"/> Other (explain in remarks)                 |

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

**Restrictive Layer (if observed):**

 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

 Hydric soil present? Y

Remarks:

**HYDROLOGY**
**Wetland Hydrology Indicators:**
**Primary Indicators (minimum of one is required; check all that apply)**

- |  |   |
|--|---|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input checked="" type="checkbox"/> Drift Deposits (B3)            | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks)                 |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   |
| <input type="checkbox"/> Water-Stained Leaves (B9)                 |   |

**Secondary Indicators (minimum of two required)**

- |  |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Geomorphic Position (D2)                  |
| <input type="checkbox"/> FAC-Neutral Test (D5)                     |

**Field Observations:**

Surface water present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches): _____
Water table present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches): _____
Saturation present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches): _____

 (includes capillary fringe)

 Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# **WETLAND DETERMINATION DATA FORM - Midwest Region**

Project/Site Former Refined Metals Corp City/County: Beech Grove/Marion Sampling Date: 4/23/12  
 Applicant/Owner: Advanced GeoServices State: IN Sampling Point: WD-8  
 Investigator(s): Colin Keith, KERAMIDA Section, Township, Range: 27-15N-4E  
 Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): Slight Concave  
 Slope (%): 0 Lat: 39.717161 Long: 86.063864 Datum: WGS84  
 Soil Map Unit Name Urban Land-Crosby Complex VWI Classification: Not Classified

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)  
 Are vegetation       , soil       , or hydrology        significantly disturbed? Are "normal circumstances" present? Yes  
 Are vegetation       , soil       , or hydrology        naturally problematic? present? Yes

## **SUMMARY OF FINDINGS** (If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u> If yes, optional wetland site ID: <u>Wetland Area 4</u>
Hydric soil present? <u>Y</u>	
Wetland hydrology present? <u>Y</u>	

Remarks: (Explain alternative procedures here or in a separate report.)

## **VEGETATION -- Use scientific names of plants.**

Tree Stratum (Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Dominance Test Worksheet</b> Number of Dominant Species that are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across all Strata: <u>2</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
1 <u>Fraxinus pennsylvanica</u>	<u>45</u>	<u>Y</u>	<u>FACW</u>	
2 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>45</u> = Total Cover				
Sapling/Shrub stratum (Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Prevalence Index Worksheet</b> Total % Cover of: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>65</u> x 2 = <u>130</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>65</u> (A) <u>130</u> (B) Prevalence Index = B/A = <u>2.00</u>
1 <u>Lonicera morrowii</u>	<u>      </u>	<u>      </u>	<u>NI</u>	
2 <u>Acer negundo</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
3 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>20</u> = Total Cover				
Herb stratum (Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Hydrophytic Vegetation Indicators:</b> <u>      </u> Rapid test for hydrophytic vegetation <u>X</u> Dominance test is >50% <u>X</u> Prevalence index is ≤3.0* <u>      </u> Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) <u>      </u> Problematic hydrophytic vegetation* (explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
2 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
6 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
7 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
8 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
9 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
10 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>0</u> = Total Cover				
Woody vine stratum (Plot size: <u>      </u> )	Absolute % Cover	Dominant Species	Indicator Status	<b>Hydrophytic vegetation present?</b> <u>Y</u>
1 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
2 <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>0</u> = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet)

## SOIL

Sampling Point: WD-8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 3/2	100					SCL	

\*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. \*\*Location: PL = Pore Lining, M = Matrix

## Hydric Soil Indicators:

- |   |   |
|---|---|
| <input type="checkbox"/> Histisol (A1)                                | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)                         | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                            | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                        | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)                       | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                              | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)                     | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                     | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)                 |   |

## Indicators for Problematic Hydric Soils:

- |   |
|---|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)    |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L)               |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)  |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12)           |
| <input type="checkbox"/> Other (explain in remarks)                 |

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

## Restrictive Layer (if observed):

 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_
Hydric soil present? Y

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |  |
|--|
| <input type="checkbox"/> Surface Water (A1)                        |
| <input type="checkbox"/> High Water Table (A2)                     |
| <input type="checkbox"/> Saturation (A3)                           |
| <input type="checkbox"/> Water Marks (B1)                          |
| <input type="checkbox"/> Sediment Deposits (B2)                    |
| <input checked="" type="checkbox"/> Drift Deposits (B3)            |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   |
| <input type="checkbox"/> Iron Deposits (B5)                        |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |
| <input type="checkbox"/> Water-Stained Leaves (B9)                 |

- |   |
|---|
| <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- |  |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Geomorphic Position (D2)                  |
| <input type="checkbox"/> FAC-Neutral Test (D5)                     |

## Field Observations:

Surface water present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches): _____
Water table present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches): _____
Saturation present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches): _____

 (includes capillary fringe)
Wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

